The RUBBER AGE

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Late News of the Rubber Industry

Goodyear Gets Plantation Concession in the Philippines

THE Goodyear Rubber Plantation Company, with headquarters at Akron, O., has recently been registered at Manila as a Philippine corporation and licensed to grow rubber on the island of Mindanao. The capitalization of the corporation is set at $6,000,000. The company is a subsidiary of the Goodyear Tire & Rubber Company. This is the first definite move of any of the larger rubber companies toward developing plantations in the Islands, and comes just five days after the introduction of a bill in the Philippine House of Representatives to increase the amount of land which may be leased from the Government to 12,355 acres and the length of the lease to 50 years and longer through renewals.

The present law, which has been the stumbling block in the development of Philippine rubber plantations on a large scale in the past, limits such a corporation to a maximum of approximately 2,500 acres. If the land law is amended as proposed it is probable that the Goodyear company will be followed by others who have attempted negotiations with the Philippine government in the past.

It is understood, however, that the Goodyear Rubber Plantation Company, will not wait upon favorable action on the land law bill but will immediately go ahead on a development of 2,500 acres now permitted. Goodyear already has a rubber plantation in Sumatra consisting of for the new development.

New York Group Plans First Fall Meeting

THE New York Group of the Rubber Division, American Chemical Society, will hold the first of its fall and winter series of meetings on the evening of October 10 at the Town Hall Club, 123 West 43rd Street, New York City. A dinner at the club will precede the business meeting and lecture.

The speaker will be Charles R. Boggs, factory manager of the Simplex Wire and Cable Company, and also chairman of the New England Group, who will talk on the "Manufacture, Technology and Testing of Rubber Covered Insulated Wire."

The prominence of the lecturer and the importance of his subject are in keeping with the high standards which have characterized the previous meetings of the group and should make the coming meeting one of especial interest. It is understood that the lecture will have much of interest for the non-technical members of the rubber industry and a large number is expected from outside the membership of the Group. Reservations for the dinner can be arranged through the secretary and treasurer, D. F. Cranor, of Binney & Smith Company, New York City.

Firestone's Liberia Project Gets Into World Politics

AS a result of Professor Raymond G. Buell's charges which were again aired at the Williamstown Institute of Politics during the week of August 27 and denials issued from the State Department at Washington through William H. Castle, Jr., acting Secretary of State, and from President C. D. B. King, of Liberia, the Firestone rubber plantation project in Africa has been again featured prominently in the news of the fortnight. Dr. Buell's charges also called forth an emphatic and indignant denial from Harvey S. Firestone, Sr., president of the Firestone interests. Mr. Firestone's refutation followed closely the lines of the reply which his son, Harvey S. Firestone, Jr., forwarded to THE RUBBER AGE and which was published in our last issue.

The attack of Dr. Buell, who is a professor at Harvard University, contains two major allegations. First: That in view of the huge extent of the Firestone concession and the statement by the company that when under full operation a total of 300,000 laborers from native tribes will be needed, recruiting on a large scale will eventually bring about a system of labor which will amount to peonage and that a subsequent domination by the company over the republic will necessarily follow. President King answers this charge with the assertion that Liberia has long been a sufferer from unemployment and that the Firestone project now fills a long-felt need in the economic development of both the native laborer and the republic itself.

Secondly, Dr. Buell insists that Mr. Firestone in order to secure a leverage on the government, forced Liberia to accept a loan at 7 per cent which would refund and retire a previous indebtedness carried at 5 per cent, and that the State Department used its influence to have Liberia take

such a loan in the face of opposition from the high officials at Monrovia.

Acting Secretary of State Castle categorically denies that any such pressure was exercised. President King points to the fact that conditions arising out of the World War had made it extremely desirable to refund the national debt and that as far back as 1921 the United States Government offered to make available funds which had been allocated to Liberia during the Wilson administration.

This proposal did not meet with the approval of Congress and the tentative agreement which had been reached by the two government lapsed. Nevertheless, President King said, the need for reorganizing Liberian finances still existed and Liberia, like other states in similar circumstances, took advantage of the opportunity offered by the American money market.

"In the negotiations between the government of Liberia and the Finance Corporation of America," President King continued, "there was no participation by the Department of State and the only reference in the agreement to the government of the United States was the provision for the designation by the President of the United States of a financial adviser."

In a weak effort to involve the name of Herbert Hoover in the controversy, Dr. Buell charges that the former Secretary of Commerce encouraged the Firestone interests to engage upon the Liberian enterprise through the former's fight against the British Restriction Act. To those close to Mr. Hoover during the days of his strenuous efforts to counteract the British restrictive measures, nothing could be more of a misinterpretation of facts. It can almost be said that not only did Mr. Firestone select Liberia for his rubber experiment without consulting Mr. Hoover but he actually did it in spite of him and before Mr. Hoover had completed the investigations authorized by Congress to determine the possibilities of growing rubber in territories more or less free from British domination.

In the meantime and in spite of the forceful answers to Dr. Buell's charges it is probable that the controversy will bob up again as it is understood that the Association for the Protection of Native Peoples has brought the matter up for review to the Mandate Committee of the League of Nations now sitting at Geneva.

Ford Plantation Supplies Reach Brazil

CABLEGRAMS from Brazil on September 5 announced the arrival of three ships of the Ford Motor Company at the mouth of the Tapajos river, carrying personnel and supplies for beginning the development of the Ford rubber plantations for which a large concession of lands was received early this year. All of the materials on the ships were entered free of duty in accordance with the terms of the concession. Among the personnel were engineers, mechanics and physicians.

Ford representatives announced that actual planting of rubber would be deferred pending a thorough preliminary preparation, including the construction of villages, sanitary works, roads and transportation facilities.

Safety Record Of the Rubber Industry

THE chairman of the rubber section of the National Safety Council has notified THE RUBBER AGE that the July news-letter of the section was in error in reporting the rubber industry as the most hazardous among a large group of American industries reporting on their accidents to the Council. Due to a typographical error, the accident record of the rubber industry was confused with that of quarrying and it was made to appear that the industry is more hazardous than is actually the case. Following the publication of the notice in the section's news-letter, the showing of the rubber industry was commented on in several journals, including THE RUBBER AGE. Progress of the drive for safety in the rubber industry will be discussed when the section holds its annual meeting in New York City, October 1-5.

Tire Warranty Wins Public's Approval

THE Rubber Institute is still carrying on its huge advertising campaign in the interest of the new tire warranty. The reception of the guarantee by the tire dealers has been cordial and the wall display copies of the warranty, sent out by the Institute to all dealers, are being hung in conspicuous places.

For the most part the new standard warranty for pneumatic casings and tubes, which was adopted by the Rubber Institute and given so much recent publicity in the news and trade press of the country, has met with the approval of the dealers and the consuming public. Favorable editorial comment ranges from calling the Institute's action "a protection of a sound sort," to heralding the guarantee as the application "of business religion to the rubber industry."

Low Prices Affect Native Rubber Output

RECENT rubber production statistics published by the Netherlands Indian Rubber Trade Association at Batavia, D. E. I., show clearly that the low price of crude rubber is having a depressing effect on the rubber output from native districts in the Dutch East Indies. The figures given in the following table are in metric tons and cover the periods from February through May in both 1927 and the current year. The precipitous drop in rubber prices, it will be recalled, began in February of this year.

District	*February Through May* 1927	*February Through May* 1928	*Decrease in* 1928
Rengat	2,999	2,674	325
Djambi	10,690	10,112	578
Palembang	7,751	4,424	3,327
Bandjermasin	8,287	6,763	1,524
Pontianak	6,276	2,880	3,396

Malayan Stock Figures Show But Little Gain

AT the end of July a second census of rubber stocks in the Malayan States was taken under the direction of the British restriction authorities. The increases shown over the June 30 census were so slight as to indicate that the rumors of an accumulation of upward of 100,000 tons by November were greatly exaggerated.

Malayan stocks held on estates of 100 acres or over subject to the restrictive laws have, as of July 31, accumulated to 53,666 tons, which is about 9,000 tons higher than the figures issued as of June 30. Stocks held by dealers, on the other hand, were reduced by about 4,700 tons. Included in these figures are such stocks as are constantly held for forward commitments as well as rolling stock.

Should the rate of accumulation be no greater in the coming months, the total stocks held in the East by October 31 may not reach even a total of 75,000 tons. Inasmuch as this figure embraces normal working and rolling stocks, the actual surplus capable of being thrown on the market in November should not greatly exceed 50,000 tons.

Chromolited Rubber Molds

When Molds Are Properly Plated with Chromium, They Will Cause Less Sticking Because of the Greater Resistance to the Gases and Acids That Ordinarily Affect Other Metals

By F. E. RICHARDSON
Vice-President, National Chromium Corporation

BECAUSE the advantages to be gained by the application of chromium plate to rubber molds have caused so much discussion both pro and con, it may be presumed that a more comprehensive understanding of the process of chromium plating, at least insofar as it affects the plating of rubber molds, might serve some useful purpose.

In the rubber industry it is more or less generally recognized by those who have had the opportunity to observe the results obtained from chromium plated molds that molds satisfactorily processed cause less sticking when the finished product is released from the mold than from others not so plated. The reason for this quicker release is found in the fact that chromium is not nearly so readily attacked by the gases and acids which attack other metals, with the result that a smooth surface remains indefinitely on a satisfactorily plated mold. Another reason is found in the fact that chromium can withstand terrific heat much better than other metals.

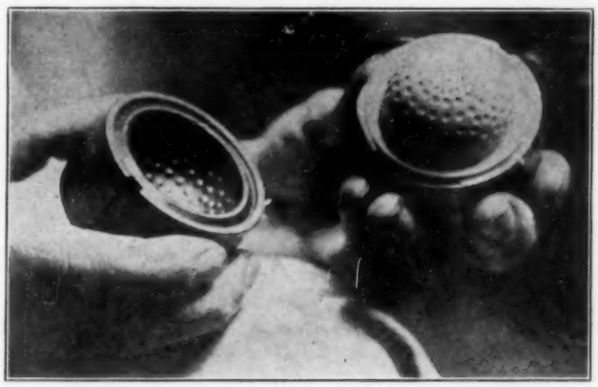
Recognizing the above mentioned facts, it is axiomatic that chromium plated molds should reduce production costs by decreasing the time it takes to release the vulcanized product from the plated mold. In some cases a saving in time of as much as 20 per cent. has been effected, to say nothing of the saving in steam which is due to the fact that chromium will retain the heat in the mold better than any other metal.

Unfortunately, however, it is also a fact that the results secured from certain types of chromium plated molds have been very unsatisfactory and even in the same kind of molds varied results have often been obtained. This uncertainty of results has led some individuals in the rubber industry to the belief that chromium plate on molds could not be relied upon, with the result that the process has not been used to as great advantage as might otherwise be the case. The process has been blamed for the lack of uniformity in the results secured, whereas actually it was the processing and not the process which was at fault.

This fact could readily be determined were one to study the resultant product as it comes from the mold. So long as the chromium plate adheres to the mold the resultant product from such a mold will be far superior to the product from a mold not so plated, because in the first instance nothing but pure rubber is released from the mold, whereas in the latter case impurities collect on the mold after it has been in operation but a short time and these impurities in turn are transferred to the rubber. In fact, it is these foreign substances or impurities which cause the rubber to stick to the mold. A chemically clean mold, absolutely free from all foreign matter and impurities, would cause no concern over the release of the rubber from the mold.

As chromium will not permit any foreign substance to adhere to it very readily, inspection usually shows that when the product begins to show signs of having a foreign substance in it the chromium plate has lifted from the mold in that spot where the impurities shown in the rubber were lifted from the mold. If this is a fact, it stands to reason that the process cannot be at fault, because were it possible to keep the chromium on that spot of the mold where it had lifted, the foreign substance would not be in the mold, and therefore, also, it would not be in the finished product. Faulty processing caused the plating to lift. If the processing were perfect, naturally the plate would have remained intact. How then, can one determine before-hand whether or not a mold can be satisfactorily processed? The answer is, know more about the process, at least insofar as it affects the plating of rubber molds.

Chromium plating is a process by which pure metallic chromium is deposited onto a base metal or other plated metal. It is deposited electrolytically, being similar in principle to other electrodepositions of metals such as nickel or copper. Unfortunately, however, the efficiency of the solution is not nearly as great as other metals similarly plated and, compared to a certain type of copper plating which is recognized as a standard of comparison, it is only about 15 per cent. efficient. The causes of this comparative inefficiency are of no particular interest so far as the present discussion is concerned but the effect this inefficiency has on



Chromolited Golf Ball Mold

the article plated is of very vital interest. For here is the major reason why chromium plated rubber molds will not always give good results. And here also is what must be understood if one wishes to determine what types of molds can be satisfactorily processed. It should appear obvious that if the chromium plating solution were 100 per cent. efficient, it would give results which cannot be hoped for with 15 per cent. efficiency. But how to determine on what type of molds this comparatively inefficient solution will give the hoped-for results is not so easy a matter.

In the first place, due to this very inefficiency, it can readily be seen that the same solution, operated by two different individuals of varied experience, would not be productive of the same results. It requires years of practical experience and specialized technical knowledge satisfactorily to operate and control a chromic acid plating solution and, because of the comparative youth of the chromium plating

industry, the number of men with such combined practical and technical experience, is quite naturally, very limited.

There are a number of circumstances that enter into the preparation and control of a chromic acid plating solution and if any one of these is not in proper balance the result might easily be unsatisfactory. For instance, if the concentration of the solution is not as it should be, the result cannot be anything but unsatisfactory. This means that the solution must be carefully analyzed at regular intervals. The number of plating plants that are equipped to do this type of work is very small.

Temperature of Solution Important

In addition to this very important factor it is necessary that the temperature of the solution be at all times controlled within narrow limits. This calls for special equipment which is not always at hand. Even assuming there is thermostatic control on tanks used for chromium plating, the temperatures used vary within wide limits, depending on what types of materials are being plated, and unless the correct temperature is used the result might not be satisfactory. The current density, or number of amperes used in chromium plating, also varies within wide limits depending also on what types of materials are being plated, and here, also, unless the correct current density is used, it will be found that the processing is faulty.

Types of Chromium Plated Molds

These, and other, considerations go to make up what is known as the technique of chromium plating and they can only be acquired through experience plus the proper background of technical knowledge.

Under these prevailing circumstances it is natural that many chromium plated rubber molds should have reached the industry which were doomed to failure before they were tried because they were plated by individuals who did not know how properly to operate and control the solution for the work on hand. Surely such failure could not be laid to the process but must be blamed entirely on the processing.

Even assuming that the processing were done by those few individuals who might be classed as experts in the field, the results on many types of molds would still be in doubt until such time as actual service tests were made. Taking for granted that the conditions under which the processing is done are as nearly perfect as it is possible to make them, there is still the inefficient throwing power of the solution to be taken into consideration when attempting to pre-determine possible results. The result is that even under ideal conditions, the chromium connot always be applied to those surfaces where it is most wanted.

It is a known fact that in all electrodepositions of metals the metal has a tendency to pile up on the edges and in proportion the areas away from the edges do not receive as great a deposit. This is especially true in chromium plating. and where regular flat or round surfaces, without raised areas or recesses, are of sufficient length or width it will be found that satisfactory processing cannot be accomplished without special preparation. Even with special preparation it is quite often impossible to secure an even deposit.

Where surfaces contain raised sections or recesses of any appreciable height or depth, it will almost invariably be found that special preparation in the form of special anodes are necessary. This is because the throwing power of the solution is not efficient enough to have the chromium reach the raised sections or recesses without such special preparation. In other types of plating, such as copper or nickel for instance, ordinarily no difficulty would be experienced in satisfactorily plating the same mold without special preparation.

The anode is the positive end of the electrical circuit used in depositing metals electrolytically and the negative end, or cathode, is the article which receives the deposit. In the case under discussion, the mold itself would be the cathode, and this mold could be suspended from what is known as the cathode bar. In order to get the chromium to adhere to irregularly shaped molds in spots where it would not get a deposit without special preparation, anodes must be made which are opposite in contour to the mold itself. If, for instance, a mold with regularly or irregularly shaped recesses was to be plated, it would first be necessary to make a male anode to fit into the female recesses, and spaced in such a manner that the positive end of the electrical current would aid in forcing the chromium into the recesses which could not be reached in any other manner.

The making and spacing of anodes is an art in itself and cannot be learned except through years of experience. It goes hand in hand with the operation and control of the solution and until an operator can satisfactorily make and space special anodes he can hardly be termed an efficient chromium plater.

As most rubber molds are of more or less intricate shapes so far as chromium plating is concerned, it would appear from the foregoing that the best procedure to follow if one were interested in having a mold chromium plated, would be to get in touch with some reliable organization that has the equipment and necessary technique to do satisfactory processing, and have them pass judgment as to whether or not the molds in question were of such shape that a satisfactory result could be expected.

Packing Crepe Rubber in Ceylon

THERE is a wide divergence among producers of crepe rubber in Ceylon as to practice of packing rubber for shipment. The most noticeable feature is the variation in amount of crepe or sheet rubber packed in chests or similar containers. The importance which is attached to economical packing appears to depend largely on whether the rubber is to be sold in Colombo or London.

The amounts packed per Momi chest may vary from 130 to 150 pounds on two estates in the same company manufacturing blanket crepe. Taking the cost of a Momi chest at 1.30 rupees, the saving in cost due to superior packing amounts to 0.13 cent per pound if the rubber is sold at Colombo. Shipping charges are made according to volume irrespective of weight, the approximate charge to London being 4.20 rupees for a chest 19 by 12 by 24 inches. In this case the cost of transport may be reduced materially by superior packing.

In extreme cases which have been noted one estate packs 150 pounds of smoked sheet per Momi chest, while another packs 225 pounds of smoked sheet per Venesta or plywood chest. After allowing for the difference in cost of chests, the saving in packing and transport to London is 77 cents.

The question often arises whether Momi or plywood chests are the more economical. Both have the same external dimensions, but the internal capacity of the plywood chest is approximately 10 per cent greater than the Momi. On the other hand, the plywood chest costs more, the prices in a specified instance being Rs. 1.34 and Rs. 2.23 each including setting up.

Observations *on* Future Rubber Footwear Production Methods

New Plants Constructed Today Would Attempt to Establish a Continuity of Production in an Unbroken Line Similar to Methods Used in Automobile Output—Present Factories Are Antiquated

(EDITOR'S NOTE: *The following article outlining the ideas of the author relative to future rubber footwear factory layouts was written by an executive of one of the best known rubber footwear factories in the United States. For personal reasons he does not wish his name to be disclosed. His reputation and long experience, however, have been such as to lend authority to his remarks.*)

WE all know that the pneumatic tire sells today for a small fraction of the price which it brought ten years ago. We also realize that the service rendered by the tire is many times greater. Part of these savings is due to lower material costs and improvements in construction but a larger measure is due to engineering achievements and more production per man hour.

In contrast, as we scan the rubber footwear wholesale list and note that men's self-acting rubbers sell for $1.00 today, and then look back to 1918, which was wartime, and note that they sold for 94 cents, it would seem that the rubber footwear production men have a few questions to answer. It is true, of course, that the 94 cents of 1918 more nearly represented the net amount which the manufacturer received owing to the present trade abuse known as the trade discount. It is also a fact that the consumer receives more value for his footwear dollar today. The product has been immensely improved, has better wearing soles and uppers and a better finish.

Present Factories Are Very Old

The rubber footwear industry is very old. For the most part the plants producing the product are housed in buildings erected 25 or more years ago. Recently an engineer made a survey of a footwear plant with the idea of reporting to financial interests as to the basic efficiency of the plant, especially with regard to machinery and lay-out. His report was in substance that if the plant were to be rebuilt today, it would not be arranged along the same lines, but in comparison to others in the industry the plant in question compared very favorably.

This leads to an interesting thought. With the experience of the past years, how would an engineer lay out a new footwear plant today?

Manufacturing rubber footwear involves the starting with certain crude materials, breaking them down into many diversified units, processing them, finally assembling them into the finished product, vulcanizing it, and packing and shipping it to the trade. It differs from all other rubber manufacture in the variety and detail of its processes.

The modern engineer would first try to achieve what the automobile manufacturer has done, namely, continuity of production in a straight unbroken line. To do this, he would undoubtedly construct a single story building instead of the usual four or five storied affair. The building would not necessarily be 50 feet by 100 feet or 200 by 1,000, as this would not fit the process. We must remember that footwear starts with the concentrated process of mixing, then branches out into four branches of calendering, five branches of cutting, six branches of preparatory work, then consolidates into four classes of making, one method of vulcanizing, finally reaching the packing and shipping operations. This would suggest an unusual factory lay-out with a building relatively narrow at the start and finish of the process and wide in the center.

Storerooms Should Be Decentralized

Storerooms would, undoubtedly, be decentralized to save handling. Crude rubber, reclaimed rubber and chemicals would be stored adjacent to the mixing department, fabrics next to the calender and spreader departments, cases and cartons in the packing department, cement mixing would be located close to the making departments and varnish mixing near the curing room.

The mixing room would be equipped with one or more large internal mixers. Calender units would be lined up beyond the mixers in units, uppers, soles, friction, and lining, running the stock on apron conveyors to the cutting departments. All would be individually motor driven and equipped with automatic cutting devices where practical with overhead conveyors to remove finished stock to rack space in the cutting room. Upper cutting would be located in a direct line beyond the upper calenders; sole cutting would be similarly linked with sole calenders; and fabric cutting with the friction and lining units. Cut parts would be segregated as they come from the machines and broken down into maker's units during the preparatory processes of cementing, quarter making, top stitching, sole making, etc. The finished sets would be placed on slow moving conveyors to be moved to the making departments.

Operators Would Be Classified

In the making department, the old idea of a standard number of footwear to be made in a day would be abandoned. And the spectacle now common in many shoe factories of fast operators departing for home at 2.30 P. M. because the day's work was done, would be eliminated. Operators would be segregated in classes—fast makers, medium paced makers, and slow makers—with each one allotted a schedule which would insure the maximum possible production in a given day. Jack devices for handling lasts would be in vogue, saving individual handling and making for more output. Finished sticks of shoes would be placed on slow moving conveyors which would carry them direct to the vulcanizer, if non-varnished goods or to the varnish machines if bright finished.

Vulcanizers would be the latest pressure type running horizontally and have doors at both ends, thus allowing shoes to be run in at one end and taken out at the other when finished, eliminating all back-tracking. Last stripping would be done by automatic machines and the lasts returned to the making department by conveyor. This would make it possible to cure twice or more on the same

last in the same day especially with the new short cures. Another saving from this would be a reduction in investment in lasts.

Packing and inspecting would be done on a conveyor system and the shipping department would have ample space for the segregation of large individual orders as they came through production, and for accumulation of stocks by kinds. Shipping clerks in putting up orders would assemble them adjacent to conveyors with direct connections to trucks and freight cars to insure minimum loading time.

To accomplish such a lay-out as outlined would require detailed study in timing of processes so that the productive flow would be as continuous as possible. The aim would be to eliminate process storerooms as far as possible. Every footwear mill has a multiplicity of these today, partly due to antiquated buildings, and partly to the necessity of assembling parts after each process for checking.

It is difficult to estimate how much productive cost could be reduced by such a lay-out and equipment, but there is no doubt that something worked out along these lines would repay the investment in a short enough time to make it worth while.

Goodyear Dirigible Designs Win First Place

THE Goodyear-Zepplin Corporation was awarded the highest figure of merit in the Navy Department's design competition for two dirigibles of 6,500,000 cubic feet capacity each. Schutte & Company of Berlin was awarded the second high figure of merit, according to announcement made on September 5, and the American Brown Boveri Electric Corporation of Camden, N. J., was ranked third.

The actual award of contracts for the construction of the airships will not be made until September 11 when Secretary Wilbur returns to Washington. A board, headed by Rear Admiral William A. Moffett, chief of the Naval Bureau of Aeronautics, considered competitive designs submitted by 12 concerns and individuals before selecting the Goodyear plans.

Wages in the Rubber Industry, 1914-1927

THE National Industrial Conference Board, Inc., New York City, has recently published an economic survey of "Wages in the United States" over the period from 1914 to 1927, giving in particular a survey of the wages in various collective industries including the rubber goods manufacturing industry. The book is a carefully prepared study of wages, hours of work and employment conditions in the United States over the period under review.

The data on which the resulting tabulations were based was secured through the cooperation of the owners and managers of some 1,600 industrial plants in twenty-five basic industries. By their number and the aggregate number of employees reported upon it is felt that a resulting tables are representative of each industry as a whole.

The treatment given to the wage conditions within the rubber industry is not as complete as in the case of some of the other industries, but should be of interest to the rubber trade in general.

The relatively insignificant difference in wages in 1927 as compared to as far back as 1920 is astonishing and not quite acceptable without further detailed proof and comes as a surprise to rubber manufacturing circles. The only real advance in the wage scale and average hourly earnings apparently took place between 1914 and 1920. Wages have remained more or less constant since. The weekly average wage as given seems to be extremely low in comparison to the weekly rate as generally believed to be enjoyed by rubber workers.

Another interesting feature to be noted from the figures given in the following table is the way that the number of employees in the rubber industry has been more or less constantly maintained. The fact that the number of workers have not increased since 1920, in the face of the tremendous increase in the production of rubber goods, speaks highly for the efficiency in the industry.

Composite and Classified Payroll Data—Rubber Manufacturing

	All Wage Earners						Male-Unskilled				Male—Skilled and Semi-skilled				Women			
	No. Wage Earners Index Nos.	Av. Week Per Wage Earner	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly
1914																		
July		49.1	$.250	$12.28	100	100	$.209	$11.10	100	100	$.285	$13.85	100	100	$.181	$8.80	100	100
1920																		
Third Quarter	74.0	43.1	.686	29.57	274	241	.638	29.74	305	268	.772	32.71	271	236	.444	19.56	245	222
Fourth Quarter	49.6	40.5	.648	26.28	259	214	.595	26.14	285	235	.758	29.98	266	216	.432	18.05	239	205
1921																		
Third Quarter	54.8	45.6	.576	26.28	230	214	.398	18.31	190	165	.658	30.39	231	219	.361	15.68	199	178
Fourth Quarter	53.8	44.7	.516	23.07	206	188	.395	18.02	189	162	.598	26.49	210	191	.349	15.78	193	179
1922																		
Third Quarter	61.8	44.8	.581	26.02	232	212	.479	22.88	229	206	.645	29.29	226	211	.377	15.73	208	179
Fourth Quarter	64.4	45.8	.575	26.36	230	215	.485	23.22	232	209	.642	29.50	225	213	.377	16.81	208	191
1923																		
Third Quarter	57.8	42.2	.631	26.63	252	217	.515	24.56	246	221	.709	29.90	249	216	.427	17.16	236	195
Fourth Quarter	62.5	44.0	.613	26.95	245	219	.524	25.42	251	229	.687	30.51	241	220	.428	17.57	236	200
1924																		
First Quarter	67.6	44.0	.636	27.96	254	228	.544	26.71	260	241	.705	31.58	247	228	.432	16.87	239	192
Second Quarter	64.6	43.9	.637	27.94	255	228	.533	25.31	255	228	.705	31.48	247	227	.432	17.14	239	195
Third Quarter	57.7	44.5	.632	28.09	253	229	.525	24.38	251	220	.689	30.93	242	223	.427	17.67	236	201
Fourth Quarter	66.9	44.3	.643	28.49	257	232	.518	25.59	248	231	.710	31.68	249	229	.437	17.95	241	204
1925																		
First Quarter	70.7	45.2	.646	29.17	258	238	.527	25.97	252	236	.714	32.51	250	235	.441	18.67	244	212
Second Quarter	74.9	44.1	.657	28.99	263	236	.544	26.78	260	243	.720	32.19	253	232	.458	18.20	253	207
Third Quarter	72.0	45.0	.643	28.95	257	236	.535	26.26	256	239	.702	31.77	246	229	.441	18.54	244	210
Fourth Quarter	75.8	44.1	.643	28.35	257	231	.532	25.57	254	232	.716	31.52	251	228	.443	18.78	245	213
1926																		
First Quarter	77.1	45.2	.664	30.03	266	245	.536	26.78	256	241	.746	33.82	262	244	.445	18.91	246	215
Second Quarter	75.8	44.3	.671	29.73	268	242	.538	26.12	257	235	.751	33.45	264	242	.457	19.09	252	217
Third Quarter	74.2	45.7	.655	29.93	262	244	.539	27.29	258	246	.726	33.18	255	240	.445	19.40	246	220
Fourth Quarter	73.1	44.7	.656	29.37	262	239	.548	27.38	262	246	.728	32.32	255	233	.449	19.59	248	223
1927																		
First Quarter	76.3	46.1	.662	30.49	265	248	.558	27.94	267	252	.733	33.96	257	245	.446	19.46	246	221
Second Quarter	80.1	46.1	.666	30.73	266	250	.568	28.07	272	253	.736	34.12	258	246	.450	19.78	249	225
Third Quarter	76.0	45.2	.658	29.76	263	242	.566	28.18	271	254	.722	32.92	253	238	.458	19.23	253	219
Fourth Quarter	75.6	44.2	.655	28.97	262	236	.573	27.83	274	251	.732	32.27	257	233	.447	19.28	247	219

The Headquarters *of the* Rubber Institute

Director General Lincoln C. Andrews at His Desk

THE Institute's offices are tastefully decorated and handsomely appointed in recognition of the importance of the industry which the organization represents. General Andrews personally inspected and approved the decorator's plans before they were executed. The accompanying photographs were made by Blank & Stoller especially for THE RUBBER AGE.

THE furnishing and decorating of the new offices of the Rubber Institute, Inc., at 1776 Broadway, New York City, has now been completed. The accompanying photographs are the first to be taken. The Director General's room will also serve as the Board Room for meetings of the Directors. The offices occupy a complete floor of the building.

July Rim Production Drops

A CONSIDERABLE gain over 1927 figures was shown in the production of automobile rims during July although there was a slight decrease from the record output of June of this year. The number of rims inspected and approved by the Tire and Rim Association of America, Inc., during July totaled 2,209,692 as compared with 2,429,453 in June and 1,679,587 in July of last year. Increases in output were especially marked in the 18-inch balloon size.

Rim Size	July 1928 No.	%	7 Mos. 1928 No.	%
Motorcycle				
24x3	1391	0.1	22562	0.1
26x3	4008	0.2	31396	0.2
38x3	——	—	753	0.0
Total	5399	0.3	54711	0.3
Clincher				
30x3½	90403	4.1	338934	2.2
31x4	424	0.0	2392	0.0
Total	90827	4.1	341326	2.2
18" Balloon				
18x3½	——	—	9362	0.1
18x4	111778	5.1	800818	5.3
18x3.25	13265	0.6	53003	0.3
18x4½	7632	0.3	85931	0.6
18x5	3699	0.2	3777	0.0
Total	136374	6.2	952891	6.3
19" Balloon				
19x2.75	11080	0.5	17433	0.2
19x3½	104615	4.7	1274394	8.4
19x4	264014	12.0	1454388	9.6
19x3.25	878	0.0	5619	0.0
19x4½	57587	2.6	627540	4.1
19x5	13768	0.6	21271	0.1
Total	451942	20.4	3400645	22.4
20" Balloon				
20x2.75	72867	3.3	105027	0.7
20x3½	20805	0.9	355035	2.3
20x4	321396	14.9	2253228	15.2
20x4½	86440	3.9	284339	1.9
20x5	144636	6.5	498168	3.3
20x6	7764	0.4	72220	0.5
Total	653908	29.9	3568017	23.9
21" Balloon				
21x2.75	463844	21.5	3821306	25.2
21x3½	108763	4.9	549859	3.6
21x4	26378	1.2	431375	2.8
21x4½	19057	0.9	254032	1.7
21x5	——	—	7240	0.0
21x6	1518	0.1	4233	0.0
Total	619560	28.6	5068045	33.3
22" Balloon				
22x3½	266	0.0	1775	0.0
22x4	597	0.0	2162	0.0
22x4½	——	—	1450	0.0
Total	863	0.0	5387	0.0

Rim Size	July 1928 No.	%	7 Mos. 1928 No.	%
High Pressure				
30x3½-23	4541	0.2	34878	0.2
31x4 -23	——	—	640	0.0
32x4½-23	3494	0.2	50229	0.3
32x4 -24	11525	0.5	51645	0.3
33x4½-24	——	—	406	0.0
32x3½-25	——	—	——	—
33x4 -25	357	0.0	2198	0.0
34x4½-25	801	0.0	5132	0.0
Total	20718	0.9	145128	0.8
20" Truck				
30x5	143782	6.5	1134836	7.5
32x6	43828	2.0	265078	1.8
34x7	11620	0.5	73984	0.5
36x8	11069	0.5	43959	0.3
40x10	941	0.0	3927	0.0
Total	211240	9.5	1521784	10.1
22" Truck				
36x7	1200	0.1	8987	0.1
38x8	——	—	200	0.0
Total	1200	0.1	9187	0.1
24" Truck				
34x5	1775	0.1	14487	0.1
36x6	7727	0.4	31466	0.2
38x7	3040	0.1	36999	0.2
40x8	3722	0.2	21627	0.1
44x10	——	—	796	0.0
Total	16264	0.8	105375	0.6
Airplane				
8x3 SS	21	0.0	21	0.0
12x3 SS	2	0.0	21	0.0
18x3 SS	36	0.0	92	0.0
20x3 SS	6	0.0	6	0.0
20x3½ SS	38	0.0	1409	0.0
20x4 SS	48	0.0	586	0.0
21x4 SS	——	—	21	0.0
20x5 SS	16	0.0	68	0.0
20x6 SS	26	0.0	2291	0.0
24x10 SS	53	0.0	53	0.0
18x4 Cl.	1151	0.1	6667	0.0
Total	1397	0.1	11235	0.0
GRAND TOTAL	2,209,692		15,183,731	

Tire and Tube Production is Still High

THE output of tires and inner tubes by manufacturers in the United States remained at a high level during June, although falling slightly below the record breaking figures for May, according to the report of the Rubber Association of America, Inc. That dealers are selling rapidly is indicated by the fact that shipments from factories exceeded even the May totals.

The figures for June as released by the Rubber Association represent 75 per cent of the total industry in the United States and have been brought up to represent 100 per cent in the following table:

TIRE AND TUBE PRODUCTION

	May, 1928			June, 1928		
	Prod.	*Ship.*	*Inven.*	*Prod.*	*Ship.*	*Inven.*
Pneumatic Casings	*(All Figures Represent Thousands)*					
All type	6,759	6,457	13,024	6,692	7,117	12,162
Balloon	4,878	4,314	7,225	4,878	4,648	7,450
High Pressure Cord	1,872	2,094	5,536	1,794	2,417	4,483
High Pressure Fabric	9	49	263	20	51	128
Solid and Cushion Tires	62	63	204	64	64	205
Inner Tubes						
All types	7,168	6,300	17,702	6,953	7,136	17,159
Balloon	4,927	4,015	9,408	4,737	4,245	9,748
High Pressure	2,241	2,285	8,295	2,215	2,891	7,411

Further detailed comparative tables covering previous months with yearly totals, will be found in the statistical section of this issue of The Rubber Age.

Schaphorst's CHATS *with the* ENGINEER

By W. F. Schaphorst, M.E.

Dust as a Fuel

THE Department of Agriculture recently caused considerable speculation and comment by operating an automobile engine on grain dust. Although it operated very feebly the event is heralded by some papers as "epoch making." One paper asks, in a humorous vein I presume: "Can one hope that some day a few minutes use of the vacuum cleaner will furnish the fuel needed to make the week-end trip in the flivver?"

Probably in a few isolated instances it will some day be possible to economically utilize dust as an explosive fuel, but I have my grave doubts.

It is true that dust explodes and that with each explosion force is exerted and some power is available. The force is considerable, too, in a few cases, as with flour dust, coal dust, grain dust, etc., but nevertheless the natural supply of dust, even in the "dusty industries," is very small, and hardly sufficient for serious power consideration. The only possibility of dust utilization as I see it, would require the grinding of grain, starch, sugar, etc., into very small dust particles and then utilizing it in the same way that Diesel tried to use coal dust in his engine.

It is commonly believed that a pound of gun-powder or a pound of nitro-glycerine, or TNT, contains more energy than a pound of coal, but not so. A pound of coal contains more energy than a pound of any of the high explosives.

The same is true of grain dust: a pound of grain dust contains less energy than a pound of coal or a pound of oil. Therefore by using dust we are not getting something for nothing.

Special vs Stock Belting

A PROMINENT manufacturer of leather belts points out reasons why it is a good rule to buy stock leather belts in preference to leather belts that are special or made to order.

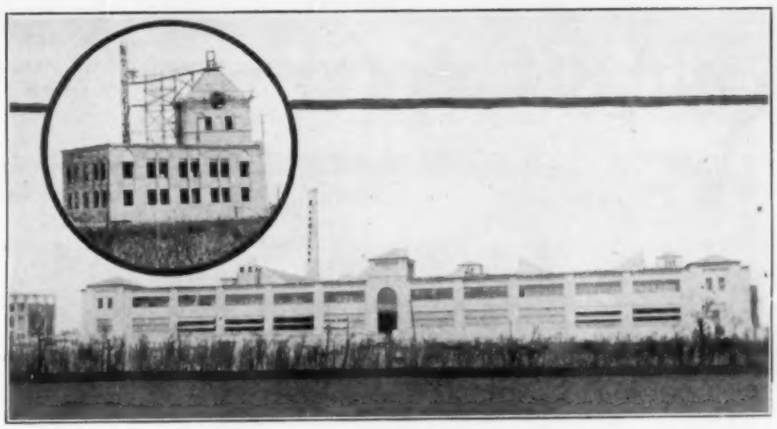
He states that it is always well to allow leather to season just before making it into stock so that the moisture content will be just right and so that the leather will have an opportunity to "set." In the stretching process the leather fibres are more or less distorted and they naturally must adjust themselves during the seasoning period. Seasoning requires time.

It is obvious therefore that if new hides are purchased for the making of a special belt, quickly tanned, quickly stretched, and then made into belting, all within a short period of time, the belt may not be properly seasoned and the chances are that it will not give as good results as would a "stock" belt.

It is also pointed out that when an order is received for a belt to be specially made, the manufacturer is "certain" that he has made the sale which may lead to a bit of carelessness in mixing seasoned hides with hides that are not seasoned. On the other hand, when making belting to be placed in stock, the workmen are not hurried, and the inspector has more time to look over and test the work. In fact, all of the points indicate that the stock made belt is likely to be better.

Firestone's New Plant at Los Angeles

Factory Completed in Record Time at Expense of $7,000,000—Represents Latest Improvements in Design and Equipment.



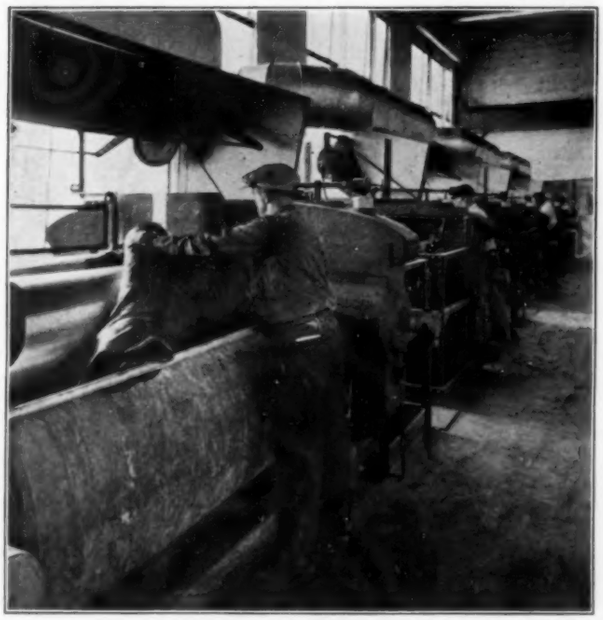
The First Unit of the New Firestone Los Angeles Factory. Insert: The Administration Building. The Plant was Formally Opened June 18, with Harvey S. Firestone, Sr., Building the First Tire, Assisted by His Four Sons

THE new Firestone Tire & Rubber Company plant at Los Angeles, Cal., which was formally opened on June 18 and which will begin production, officially, early in October, represents the last word in factory construction and operation.

The outstanding efficiency factor in the machinery assembly of the plant, is the highly scientific manner in which the straight line production system has been used. The elimination of the causes of lost motion has been carefully considered in the space allotment and placing of equipment. From the time the crude rubber and other materials that enter into the production of tires arrive at the factory until they reach their ultimate destination which, as far as the factory is concerned, is the shipping room, everything with a single exception is handled by conveyers.

The increased efficiency at the plant does not lie so much in the use of radically new machines or methods but in bringing all the factors involved into harmony with the latest and most accepted principles of scientific management and plant lay-out.

The mixing mills, calenders and tubing machines, as well as the cutting and assembling machines are located in a straight line. When the end of the building is reached, trucks are used for a distance of approximately 200 feet taking material to the conveyers extending along the opposite side of the building. These conveyers carry material to the tire building machines and also pick up the built-up tires which are conveyed to the curing department. The green tires are placed in the molds and the cured tires in turn, are placed on the conveyers for delivery to the inspection department. In this department there is a series of conveyers on which the various operations are performed, down to the final inspection. The tires are then conveyed to the wrapping machines and after being wrapped they are conveyed to the warehouse.



Mill Line of New Firestone Plant

The inner tubes are handled in pretty much the same way. They are conveyed along the line until finally inspected and boxed ready for shipment. The operations necessary in making and boxing a tube, which formerly extended over a period of two or three days, may now be accomplished in thirty-five minutes.

Conveyor System Automatically Timed

The conveyer system is automatically timed and synchronized with all operations which are carefully timed, also. The conveyer automatically stops at certain points at exactly the proper time and moves on again in a similar manner. Thus much waste of time is eliminated and production is automatically speeded up.

A great saving of time and energy is accomplished by the use of the side wall assembly machine. With this machine the layers of material which form the side wall of the tire are automatically assembled and go to the tire builder in stripped form.

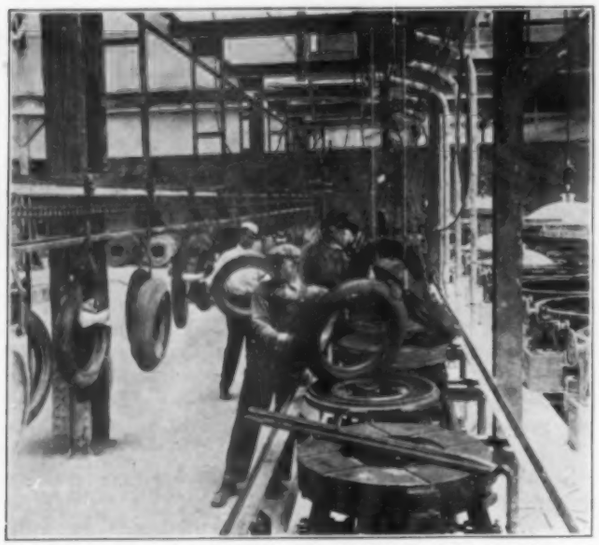
In the "gum-dipping" process, material is conveyed to a point above the vats and merely dropped down to be dipped. This method of having the conveyor located at a higher level so as to take advantage of the law of gravity results in increased efficiency. While the process of gum-dipping is in use in other Firestone plants the method by which the law of gravity is made to serve is used at the new plant for the first time.

T. E. Pittinger, production manager, says, "While only new machinery of the very latest type is used in this plant the increased efficiency is almost entirely due to the highly scientific use of the straight line production system. Of course, having nothing but the latest approved type of machines is an advantage, but there is no distinctive feature on any machine that we have not used before."

The new ideas in production efficiency that have been put into operation in this factory are mainly the result of intensive study of ways and means of eliminating waste

motion, which automatically speeds up production and reduces cost.

It was only a few days over six months from the time construction work was started on the new plant that the first tire was made. Harvey S. Firestone, president of the



Taking Out Cured Tires from Molds and Putting in "Green" Ones

company, came to Los Angeles and personally built the first tire. Russell Firestone, second son of the president, will hold the office of executive vice-president in charge of the western interests of the firm. The total investment in land, buildings and equipment is estimated to be in the neighborhood of $7,000,000.

The first unit of the plant covers ten acres of floor space. All the manufacturing departments are located on the main floor. The huge ventilators above the one story portion of the plant and the large factory windows used insure excellent light and ventilation. In no part of the large structure is artificial light necessary during the day. The entire floor area, other than the portions used for office space, is paved with wooden blocks on a concrete base.

When the plant is in full operation, it is expected that the output will be in the neighborhood of 5,000 tires and 7,000 inner tubes per day, and that approximately 1,000 persons will be employed. Production has been commenced on a somewhat limited scale, but will be increased to capacity within the next six or eight weeks.

Abrasion Tests To Be Published Soon

THE work of the physical testing committee of the Rubber Division, American Chemical Society, carried on at the Bureau of Standards, Washington, D. C., last year, in which the effect of temperature and humidity upon the stress strain relation, both subsequent and prior to vulcanization, was investigated, will soon be published in *Industrial and Engineering Chemistry*, according to a recent announcement from the committee.

Several thousand tests were made covering a range of relative humidity from 0 to 100 per cent and a range of temperatures from 5 to 45 degrees Centigrade. These ranges were covered with 5 compounds and each compound was represented by a range of 5 cures.

The work is now being extended with three of the compounds used previously and an additional one which simulates a commercial heel compound, in a study of resistance to abrasion. This resistance to abrasion is being determined over a range of temperatures and humidities. The investigation is only partially completed but it has been found that a difference of 20 degrees C. may cause a 25 per cent change in resistance to abrasion. This difference due to temperature varies both in degree and kind with the compound used.

Measurements of resistance to abrasion are being made in each case with two machines of quite different types. The Grasselli instrument, which works on the Prony brake principle, gives results in volume abraded against an emery paper, per horsepower hour, while the United States machine records the volume abraded per hour by a wheel bound with emery cloth, with no power measurements taken.

Styrene in Manufactured Gas

The organic chemical laboratory of the U. S. Bureau of Mines has suggested that styrene, a compound always present in manufactured gas, may be found useful in the rubber industry. At the present time styrene, together with an allied substance, indene, form troublesome gums in the tanks, mains and meters of artificial gas companies. The Bureau of Mines believes that research would show that these substances have useful applications in industry and suggests that the rubber industry, along with the manufacturers of perfumes, may find an important use for styrene.

International Rubber Footwear Trade

THE United States in 1927 was the largest exporter of rubber footwear, with 8,140,601 pairs, valued at $7,072,937, according to the reports of the Department of Commerce. Our nearest competitor was Canada, which exported 6,670,048 pairs, valued at $5,701,115, followed by France with an estimated 4,138,000 pairs and the United Kingdom with 2,980,608 pairs. These statistics include rubber boots, overshoes, galoshes, and canvas rubber-soled shoes.

Of the four major sources, the United Kingdom occupies a peculiar position, maintaining an unfavorable balance in the trade of rubber footwear. Besides being a world competitor, the United Kingdom imports large quantities from Canada, France, and the United States, being the principal outlet for the products of all three countries.

Although the United States maintained the lead in exports of rubber footwear in 1927, a decline in volume of 4 per cent, or 337,354 pairs, took place as compared with 1926. On the other hand, Canada, the strongest competitor, increased exports by 39,985 pairs.

This large increase in the Canadian trade of rubber footwear places Canada as the leader during the first half year 1928, exceeding the United States by 72,436 pairs. This excess is in the trade of canvas rubber-soled shoes which during the 1928 period has amounted to 3,536,692 pairs. On the other hand, our exports of rubber boots and shoes have exceeded those of Canada by a substantial margin.

France falls into third place, with 56 per cent of the total trade for 1927, and the United Kingdom with 53 per cent. Thus, it is evident that American exporters of rubber footwear have not increased as rapidly as those of their competitors. If the United States is to maintain the leadership in this trade, domestic manufacturers must increase their trade to a greater degree during the last six months of the year than that of the first.

Relative figures covering rubber footwear exports from the four principal exporting markets are as follows:

Country	1924	1925	1926	1927	6 months 1928
	Pairs	*Pairs*	*Pairs*	*Pairs*	*Pairs*
United States	6,278,898	6,655,258	8,477,955	8,140,601	4,097,673
Canada	3,058,934	4,431,090	6,630,063	6,670,048	4,170,108
United Kingdom	3,112,908	3,380,496	2,744,976	2,980,608	1,591,296
France[1]	3,232,000	3,888,000	4,529,000	4,138,000	2,291,000

[1]Estimated at 1¼ pairs to the kilo.

Abstracts of Chemists' Papers To Be Read at Swampscott

Papers To Be Delivered at Swampscott Present a Wide and Interesting Range of Subjects by Well-Known Chemists—Meeting of Rubber Division Will Extend Over Three Days

Abstracts of most of the papers which will be read before the annual fall meeting of the Rubber Division, American Chemical Society, in Swampscott, Mass., September 11-13, are given below. The authors, together with their company connections, are indicated in each case. The abstracts have been prepared by the authors. As will be seen from the abstracts, an unusually wide range of subjects is covered in this program. Also an unusually large number of companies are represented among the contributors. Papers read before the Divisional meetings of the American Chemical Society become the property of the Society, but, following their formal release, some of these will appear in full in THE RUBBER AGE.

The Effect of Anti-Oxidants in Typical Rubber Stocks

MARION C. REED, *The B. F. Goodrich Company*

Factory experience over several years has shown that anti-oxidants maintain the quality of rubber goods as indicated by other tests as well as by tensile strength and elongation. Tests are presented showing the effect of aging with and without anti-oxidants, on tensile strength, elongation, resistance to tear, cracking in sunlight, and hand tests. Anti-oxidants retard softening during dry heat cures. Results with tire treads, inner tubes, dry heat cured goods, specification stocks, and sponge rubber are described. Artificial aging, shelf aging, sunlight exposure, and dynamometer tests all indicate the value of anti-oxidants. Aging at 90°C. in a vacuum or inert gas produced no deterioration except that of overcure, in three typical stocks. The deteriorating effect of temperature, up to 90°C., in the absence of oxygen is negligible, compared to the effect in the presence of oxygen.

A Practical Method for Obtaining Dry Air for Humidity Control in a Rubber Laboratory

F. S. CONOVER, *New Jersey Zinc Company*

Cabinets for the dry storage of crude rubber, unvulcanized rubber during the period between milling and vulcanization, and cured samples during the period between vulcanization and testing, are described. A description and explanation is given of the silica gel apparatus used to secure the stream of dehydrated air which is used to maintain these cabinets in a dry condition. Costs of operation are discussed and safety measures for ensuring proper working of the apparatus are described.

The Mechanism of the Reinforcement of Rubber by Pigments

HARLAN A. DEPEW, *New Jersey Zinc Company*

Dispersed pigment reinforces by increasing the tear resistance. Flocculated pigment hardens rubber and reinforces by increasing the resistance to cutting. It may also increase the tear resistance, but not to as great an extent as if the pigment were well wet.

The mechanism of the reinforcement by increasing tear resistance is that the pigment particles act as obstacles that cause the tear to proceed in a longer path, going around the particles. Due to the round-about path, the component of the force in the direction of the tear may be small. Accordingly, it is possible in the case of a fine pigment to increase the tear resistance even though the rubber-pigment bond is much weaker than the rubber itself.

The hardness of a stock containing flocculated pigment is due to the rigidity of the structure assumed by the flocculated pigment.

During the early moments of hot vulcanization, rubber is fluid, and the degree of wetting may be largely determined during this period; some of the pigments becoming dispersed and some becoming flocculated.

A New Physical Test for Vulcanized Rubber

D. D. WRIGHT, *Hood Rubber Company*

This test, by use of a sample of new design, subjects rubber to a combination of tensile and shearing stresses. Shear, however, is the predominating stress. The specimen is tongue shaped. Certain aged inner tubes have been found which deteriorated more when examined by this test than a comparison of their tensile-stress-strain curves with those of fresh tubes would indicate. Tearing action seems to be approximated by the test. The effect of overcure in some cases has been recorded at earlier stages by this test than by the tensile criterion. Carbon black treads are given a much higher rating among other stocks by this test than by the usual tensile tests. The test is as easy to perform as a tensile test and checks within reasonable limits.

The Evaluation of Carbon Blacks

D. F. CRANOR AND H. A. BRAENDLE, *Binney and Smith Company*

The use of carbon black in an ever widening range of compounds and the introduction of new grades of blacks spoken of as soft carbons, calls for a means of comparing them. Careful consideration is given to the variables liable to affect any attempt to evaluate a pigment for use in rubber, and a fundamental base formula is used as a standard of reference. The quality of compounds at various pigment loadings, and the range of useful loadings for a variety of commercial and experimental carbon blacks, is quantitatively studied by means of the "Delta A Function."

The Kinetics of the Vulcanization of Rubber

BIRGER W. NORDLANDER

In a research on sulfur it was discovered that of all the various allotropic forms that sulfur possesses, only the amorphous or S_μ form is active, that is, has the ability of reacting chemically. The crystalline varieties have no reactivity even at temperatures close to the melting point. This discovery has now been used to study the kinetics of the vulcanization of rubber which has been little understood in the past. The work by Twiss in which he tries to show that the amorphous form has no more activity than other forms of sulfur has given the author a beautiful set of data by which it is shown that at all temperatures the rate of vulcanization is de-

pendent ONLY on the AMOUNT of amorphous sulfur present in the mixture. An account for the effect of accelerators can be given quantitatively on this basis, the action of these being simply to increase the total S_μ concentration at the temperature concerned.

By the work of Skellon, Spence, and others, it is shown that the vulcanization process is a zero order reaction. The significance of this is being brought out and the various factors affecting the rate involves a series of equilibria between suspended dissolved and absorbed sulfur, as well as between the allotropic forms S_λ, S_π and S_μ that exist in the sulfur at various temperatures.

The Effect of Temperature on the Stress-Strain Properties of Vulcanized Rubber

A. A. Somerville, *R. T. Vanderbilt Company*

A method has been devised and a machine has been developed for readily determining the stress-strain properties and automatically drawing the stress-strain curve of a rubber test piece at any temperature from 0° to 100°C. inclusive.

Stocks have been mixed, given a range of cures and the stress-strain curves drawn at 0° and 100°C. and comparisons of different stocks graphically charted.

The work covers the following ground:

Various Rubbers—with Sulfur
Various Rubbers—with Sulfur and Aniline
Various Rubbers—with Sulfur, Zinc Oxide, and Hexa

Effect of time of cure
Effect of temp. of cure
Effect of per cent of Sulfur
Effect of per cent of Accelerator

The Colloid Chemistry of Rubber

Benton Dales, *The B. F. Goodrich Company*

The properties of latex, including especially the phenomenon of coagulation, are discussed, as well as our knowledge of the structure of latex. The characteristics of natural rubber are given, special attention being paid to vulcanization. The more important attempts to picture a structure which will account for the properties of rubber are described, as are also the X-ray investigations into the structure of the rubber molecule. The more important colloid chemical problems connected with reclaim, synthetic rubber, and dispersions of natural rubber and reclaim are mentioned.

The Dispersion of Pigments in Rubber. 2. Effect of Natural Resins and Stearic Acid

Ernst A. Grenquist, *The Fisk Rubber Co.*

(*The experimental part of this paper was carried out at the Massachusetts Institute of Technology during the summer term* 1928 *in connection with Prof. E. A. Hauser's course in colloid chemistry.*)

In a previous paper, it has been shown that agglomeration and flocculation of pigment particles during milling and vulcanization considerably influence the degree of pigment dispersion and the reinforcing power in a rubber compound.

The present investigation confirms previous results and brings out new microscopic evidence concerning the dispersive changes brought about either by substances already occurring in crude rubber or by materials that are added during the compounding. Pigments were mixed with either crude or acetone extracted rubber. These compounds were examined with regard to pigment dispersion and were then cured under the microscope using a steam heated micro-vulcanizer under varying conditions of temperature, time of cure, etc. Interesting changes in pigment dispersion (forming the basis of this paper) were recorded either in photomicrographs or micro-cinematographically. The conclusions derived at are outlined and further microscopic research in this field is emphasized.

Rubber Structure Research and Its Bearing on the Elastic Properties of Colloids in General

E. A. Hauser, *Massachusetts Institute of Technology*

The results on structure research of rubber by the use of X-ray are discussed and effects found recently enumerated. New ideas as to the actual molecular structure of the rubber hydrocarbon are put forward and the importance of such new considerations in regard to the elastic properties of rubber is emphasized. Results obtained by the same method in the study of rubber derivatives are given to show that the difference in physical and chemical behavior of such derivatives can be traced back to a change of molecular structure as shown by X-ray investigation. The bearing of the results obtained on rubber structure research in regard to the results obtained on other elastic high molecular colloids or colloidal compounds is discussed, and finally, a new hypothesis on elasticity in general is put forward.

The Supermolecular State of Polymerized Substances in Relation to Thin Film and Interfaces

S. E. Sheppard, A. H. Nietz, and R. L. Keenan, *Eastman Kodak Company*

The compounds, gelatin, rubber, and cellulose esters, may be represented by the formulas:

Rubber $(C_5H_8)n$
Cellulose $(C_6H_{10}O_5)n$
Protein $\cdot(NHCHRCO)n$

where n indicates both an unknown magnitude and quality or kind of aggregation. The constitution of such substances is well contrasted between the "Association" theory of Hess and Pringsheim and the "macromolecular" theory of Staudinger.

A study of the behavior of these "high molecular" bodies in thin films and at interfaces is in agreement with Staudinger's conception of extended chains of atoms held by homopolar primary valences. The remaining interactions, i.e., orientations and condensations of these chains, are effected by development of alternating polarity along the chains and consequent mutual induction. The binding forces in this case (between the chains) may vary from Van der Waal's forces to electrostatic constraints. Under the influence of dissolvents, the macromolecular state may be brought to incipient dissociation—a state comparable with that postulated by the associationists.

Time- and Temperature-Plasticity Relations for Crude Rubber as Measured with the Goodrich Plastometer

E. O. Dieterich, *The B. F. Goodrich Company*

Illustrations are given of the results obtained by the use of a new plastometer whose operation is in accord with the fundamental definition of plasticity. The linear relationship between plasticity and time of mastication, for periods up to 90 minutes, is shown. Data which demonstrate the variation of plasticity with batch size are given. Curves are presented illustrating the effect of temperature upon the plasticity of masticated rubber, showing that there is no abrupt change in the plastic properties of crude rubber in the neighborhood of 70° C.

The Meaning and Measurement of Plasticity—The C. G. S. Units and a New Plastometer

E. Karrer, *The B. F. Goodrich Company*

An analysis has been made of the physical factor involved in plasticity. It is shown that plasticity may be considered as a simple function of hardness and of permanent set, it being understood that these are referring to determinations under particular given conditions. A general definition of plasticity is arrived at as the susceptibility to and the retentivity of deformation, and may be measured by the product of what may be termed deformability and retentivity. There is a close relationship in the final expression of plasticity with that of permanent set when one gives to permanent set definite and specific meaning which it does not always now possess. A new plastometer is described involving these principles based upon a definite deformation under given conditions where both the deformation and the total force required to make the deformation and the amount of deformation which is retained are measured in one record.

A unit of plasticity is suggested as the "pla," which refers to the

(*Continued on page* 621)

SAFETY KINKS *for the Rubber Factory*

No. 4 of a Series, Showing How Various Manufacturers Are Protecting Their Workmen Against Serious Accidents. Presented by Courtesy of the National Safety Council and with the Cooperation of the Rubber Section thereof.

THE accompanying series of illustrations, issued as part of the campaign undertaken by the National Safety Council to cut down the high rate of accidents in rubber and other industrial plants throughout the country, indicate some methods of promoting safety in operations involving the use of knives and shears. It is in the handling of these smaller familiar implements that a large number of the minor injuries occur. The care to be exercised means but little effort on the part of the worker. The principles illustrated in safely handling knives and shears are applicable in many ways to daily operations in practically every rubber manufacturing plant in the country and a conscientious adoption of these lessons may contribute greatly to reducing the high accident rate now prevailing in the rubber industry.

SAFE METHOD
Have knife on rigid support and use the proper size screwdriver
UNSAFE
Adjusting screw with another knife. A slip means punctured hand

Can you use these ideas to make your plant a safer place in which to work? See other "Kinks" in succeeding issues

The Hungarian Rubber Industry*

Rubber Toys Constitute the Chief Item for Export to the United States. But All Types of Products Are Manufactured—Hungarian Plants Now Make One-Third of the Number of Tires the Country Uses

By JOHN H. MORGAN, *Vice-Consul at Budapest*

THE rubber industry of Hungary, although not one of the largest, is perhaps the most firmly established in that country. It had its beginning practically in 1891, when the Hungarian Rubber Goods Factory (Ltd.) was established at Budapest. Other factories of less importance are the Dr. Dorogi & Co., and the Hungarian Rubber Manufacturing Company.

The Hungarian Rubber Goods Factory is controlled by the Budapest branch of the Wiener Bank Verein and the Dunlop Rubber Company of Great Britain. It produces the "Cordatic" tires and inner tubes, rubberized fabrics and sheeting, sanitary specialties, rubber soles and heels, and such sundries as rubber aprons, toys and the like. It is the largest of the three factories, employing approximately 1,350 workmen. It also controls the firm known as Dr. Dorogi & Co., which employs about 400 hands. The Hungarian Rubber Manufacturing Company is a small concern of less importance engaged in the manufacture of canvas rubber-soled shoes and hygienic products of the less expensive grades. All three factories are equipped principally with British, German and French machinery.

The local industry produces nearly all kinds of rubber goods except rubber boots and shoes, hot-water bottles, syringes and dental goods. The mechanical rubber goods are of excellent quality. Tires and inner tubes are produced only by the Hungarian Rubber Goods Factory.

Exports Include Only Toys and Dolls

The export of rubber goods to the United States from Hungary consists almost entirely of toys and dolls. Considerable progress has been made of late in the quality of the goods produced, especially as regards the four-legged inflatable type toys. Toys are manufactured by the Hungarian Rubber Goods Factory, Ltd., and also by the Dr. Dorogi & Co. Rubber Factory, which is controlled by the former firm. The production of rubber toys has so increased that during the first few months of 1927 there were exported 1,745 quintals (one quintal equals 220 lbs.) as compared with 994 quintals exported during the entire year of 1926, besides supplying the total demands of the local market.

The four-legged inflatable type toys are being manufactured with a new process known as the anode or electrodeposition system, first invented by Julius Klein, vice-president of the Hungarian Rubber Goods Factory, Ltd. This system has proven such a success that the Anode Rubber Company, Ltd., founded by the Hungarian Rubber Goods Factory, Ltd., has, together with large American concerns, established an American company for the utilization of the new process in the United States.†

Both Great Britain and Germany are larger purchasers of Hungarian rubber toys than is the United States, and Italy and Sweden are also large buyers of Hungarian toys.

During 1926 imports of crude rubber equaled 602 metric tons, increasing to 754 tons during the first nine months of 1927. The principal supply comes through the port of Hamburg. Reclaimed rubber is also used to a certain extent, a considerable share being reclaimed locally and the remainder imported from Germany.

The local industry is somewhat reticent in publishing information relative to production and capacity. From official sources, however, it is reported that the total production of rubber products in 1925 amounted to 1,480 metric tons, valued at 7,800,000 gold crowns, and 1926 to 1,510 metric tons, valued at 9,000,000 crowns. (The gold crown equals $0.2026.)

Production of Tires Only 14,000

Figures concerning the production of mechanical rubber goods and canvas rubber-soled shoes were withheld, but it was stated that the production of these two classes in 1926 manifested a considerable increase over 1925. According to unofficial sources, between 12,000 and 14,000 automobile tires are produced annually.

The following table gives the production of a few items as officially reported.

PRODUCTION OF HUNGARIAN RUBBER PRODUCTS

Item	1925	1926
	(In metric tons)	
Rubber soles and heels	400	480
Toys and dolls	130	80
Balls	120	32
Rubberized clothing	18	10
Bathing caps	3	4

Rubber footwear, other than canvas rubber-soled shoes, is not at present manufactured in Hungary, although important quantities are consumed annually.

The local production of automobile tires, as before stated, is estimated at 12,000 pneumatic casings and 3,000 solid tires annually. No exact statistics concerning the tire consumption are obtainable, but it is estimated that the consumption during 1927 was approximately 35,000. Dealers estimated that the demand for 1928 will surpass 45,000. According to general estimates, there were 18,550 motor vehicles in Hungary on December 31, 1927, divided as follows: 9,400 automobiles, 350 buses, 3,100 trucks, and 5,700 motorcycles.

The most important class of rubber goods exports, with the exception of toys, is that of mechanical goods. The export of these goods is nearly three times as great as the import thereof. It will be noted that the greater part of this export is absorbed by Roumania and the remainder by Jugoslavia, Turkey and Egypt. The export of other articles listed is of comparative unimportance. Although no figures are obtainable as to the value of the export of rubber toys to all countries, the export of toys is presumably more important than that of mechanical goods since the value of the toy export to the United States alone, which purchases less than one-seventh of the total, is more than $34,000.

*Abstracted from *Commerce Reports*, Department of Commerce.

†The announcement of the formation of this new company was mentioned in THE RUBBER AGE of July 10, 1928, p. 387.

Rubber *in the* Printing Industry

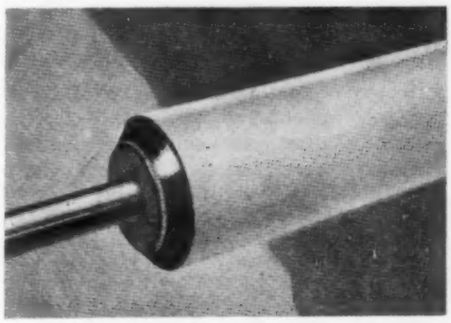
The Adoption of Rubber Rollers in Printing and Lithographing Has Been Almost Universal—Use of Rubber Press Blankets, Cutters and Rotogravure Rollers is Steadily Increasing

By D. R. SCHLITZ
Goodyear Tire and Rubber Company

MANY of the essential parts of the machinery of modern printing and lithographing establishments feature rubber in some form or other and the adaptibility of rubber in these two industries is not only fully recognized by printing engineers, but its use in this connection is steadily increasing. One of the largest manufacturers of mechanical rubber goods in the United States has developed a department which caters solely to these industries. The development of some essential rubber parts for these trades has come only after many years of experimentation.

One of the latest and most far-reaching innovations in the printing trade has been the almost universal adoption of rubber printing and lithograph ink rollers.

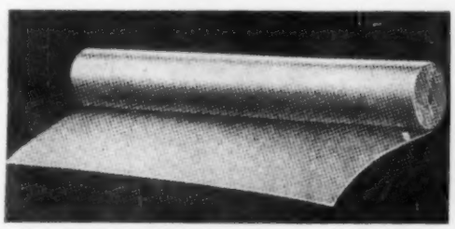
Rubber printing rollers will resist the action of oil and ink and can be used with all colors. The inconsistency of



Rubber Printing Rolls

the old composition roller has long been a source of continuous grief to the printer and the rubber roller, immune to temperature changes, has come as a welcome innovation. Unaffected by climatic conditions, rubber rollers can be used throughout the year and require no more than ordinary care. The ease with which they can be washed is another feature which commends them in place of the old composition type.

The rollers are made in such a way that the rubber cannot separate from the shaft. The high quality of the rubber used by the manufacturers insures slow wear. These

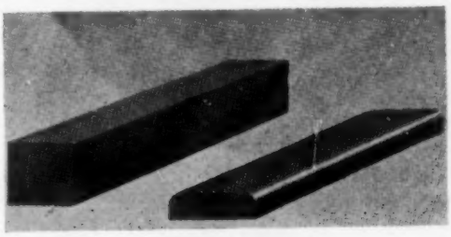


Rubber Press Blankets

rollers are used as fountain, distributor and form rollers.

Cases have been known where rubber rollers have lasted as long as seven or eight years in actual service. Rubber rollers can be reground occasionally, which makes them practically as good as new and also greatly prolongs their life. While the average cost of rubber rollers is considerably greater than the old style composition rollers, yet their durability makes them very economical in the long run. In the larger newspaper offices it has been found unnecessary to even wash the rollers.

Rollers are used extensively in lithographing because here the plate, from which the design is lithographed, is very

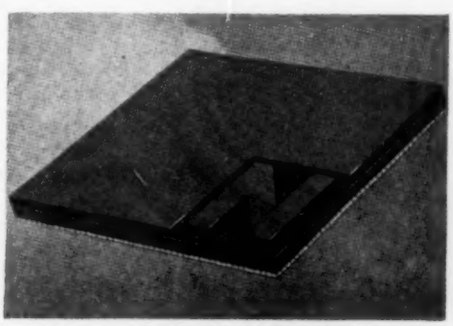


Cutting Rubbers

uniform and accurate as to gauge so that a soft rubber is not required to take care of inequalities in the plate. Lithograph rubber rollers, however, require very careful washing, because a large amount of varnish and dryer is used in high grade lithographing and unless the roller is thoroughly washed at least once a day this varnish and dryer will have a tendency to attack the rubber, causing it to become tacky. But if properly washed this trouble is prevented.

Rubber blankets, both lithograph and press, have been in use in the printing and lithographing trades for many years and have established themselves as serviceable and necessary adjuncts to the industries. Newspaper cutting rubbers, engravers' gum, vulcanized gum, transmission belting, packing hose—all contribute their share to these allied industries in making for economy and effective results.

Rubber blankets as well as felt blankets coated with a layer of rubber on the face of the felt, are extensively used



Engravers' Gum

as packing on the impression cylinders of newspaper printing machinery. Here again a very accurate product is required, especially as to gauge and again oil resisting qualities are required in the rubber compound to prevent the

action of the oil and the ink which gets onto the blankets, to a certain extent.

Newspaper press blankets have demonstrated their worth by the high quality of work which they produce, due largely to their resiliency and uniformity of gauge. This material is either marketed in rolls or in cut blankets.

Rubber blankets for newspaper printing are usually made of three plies of fabrics with a cushion stock of rubber between each ply and a face stock of rubber. The felt blankets are made by using one ply of felt with a coating of rubber on the face of it. The rubber blankets are placed on the cylinder first and the felt blanket on top of the rubber blanket, so as to build the cylinder up to the required gauge for proper newspaper printing. The sheet of paper lays against the blanket while being printed from the plates which are on another cylinder working with a slight pressure into the paper and blanket cylinder. The rubber is considered the best product for newspaper printing blankets on account of its resiliency which takes care of the inequalities in the printing plate and on account of its comeback which holds the impression cylinder up to a uniform diameter, which is very necessary in high speed newspaper printing.

Newspaper cutting rubbers are being universally adopted by all the larger newspapers. A tougher composition of rubber is used which guarantees a period of wear of from four to six months.

Lithograph offset blankets and rotogravure printing rollers have come into the industry on the heels of the newer lithographic and rotogravure processes. The offset blankets are made in standard gauge for paper, cloth and metal lithography. The rotogravure rollers have to be of especially tough material and are ground with careful precision. Rotogravure and the new water-color printing processes are bringing more and more of this rubber equipment into the printing industry.

Printing gum for printing on burlap, jute or cotton bags is also used extensively. The construction of printing gum is such that the printing characters are held firmly to the base, to produce clean cut finished work. The gum resists the destructive action of oils used in ink and is resilient and long lived. A similar gum for engravers is also used in the trade for printing on metal. Unvulcanized gum for making plates in bag printing is also very often used.

The latest developments in the engraving of rubber for printing purposes were made the subject of a special article in THE RUBBER AGE of May 25, 1928, pp. 199-200.

Atlantic City Has Rubber Exhibit

THE I. B. Kleinert Rubber Company, of New York City, have recently established a permanent exhibition store on the Boardwalk at Atlantic City, N. J., in the Hotel Apollo Building. It was formally opened to the public on June 29 and has since then attracted a large proportion of the vacation throngs.

The exhibit celebrates the Golden Anniversary of the establishment of the I. B. Kleinert Rubber Company. It is essentially not a selling proposition, but rather an advertising one with the idea of familiarizing the buying public with the many and varied items made by the company.

There are over 10,000 rubber and rubberized items manufactured by the company on display in an attractive modernistic setting. The displays are divided into various sections, the gift department, bathing section, shower curtain and rubberized fabrics, dress shields and lingerie sections, sanitary section as well as a rubber reducing department which has two fitting rooms.

Both the interior and exterior of the store are decorated in the modernistic style, offset by etched glass and chromium plate fittings. The window bases are of black etched glass with cubistic designs. The windows are finished in black marble and silver. The interior woodwork is of natural

finish maple and walnut inlay, the inlays following cubistic designs.

While purchases can be made of the articles on display, the announced idea of the company is to maintain the store as a permanent exhibit of the company's manufacturing activities and the displays are shown with that intention in view. The contention is that such exhibits not only promote future sales for the company, but assist indirectly every notion and rubber goods store in the country handling the Kleinert line.

New Bureau of Standards Journal

THE Bureau of Standards of the Department of Commerce has announced the introduction of a new monthly periodical devoted to pure and applied science to be published in Washington as an official journal of the Bureau. The publication will be known as the "Bureau of Standards Journal of Research" and will embrace the two series of papers heretofore issued, "Scientific Papers" and "Technologic Papers" and also include critical reviews in the field of science and technology.

10 YEARS AGO

Items Reprinted from September 10, 1918, issue of THE RUBBER AGE

THE Fourth Liberty Loan Campaign will begin September 28 with Bertram G. Work of the B. F. Goodrich Company in charge of the central committee of the rubber industry for the drive . . . Just as Henry Ford is notified of selection by Michigan Democrats as their candidate for United States Senator, Harvey S. Firestone declares him to be the logical candidate for president in 1920 . . . Labor Day outings of the Akron rubber companies drew thousands of employes to various local parks . . . A new rubber factory at Akron has been opened by the Quick-Fix Rubber Company . . . Ajax Rubber Company reports its earnings for the first half of the year as $1,959,608 . . . H. W. DuPuy is re-elected president of the Pennsylvania Rubber Company . . . More than 12,000 employes of the Firestone Tire & Rubber Company are covered by insurance at the company's expense . . . Goodyear Tire & Rubber Company inaugurates idea of long distance hauling by truck with shipments from Akron to Pacific Coast . . . Semi-annual meeting of the standards committee of the Society of Automotive Engineers recommends standardization of tires and rims . . . The manufacture of passenger cars for the second half of 1918 will be cut to one-quarter of the total output of the entire year of 1917 . . . Business in tires is reported as very active and some manufacturers have disposed of all their available stocks . . . Manufacturers of mechanical rubber goods are still going strong on Government orders.

Abstracts of Chemist's Papers

(*Continued from page* 616)

plasticity of a body that would deform a given amount by the application of a force of 1 kg. for 1 second, which deformation would be totally retained.

Microscopical Observations on the Vulcanization of Sulfur-Free Rubber Compounds

JAS. C. WALTON, *Boston Woven Hose and Rubber Company*

(*Written in connection with the course in Applied Colloid Chemistry given by Prof. E. A. Hauser at the Massachusetts Institute of Technology during the* 1928 *summer term.*)

A new temperature recording electrically heated micro-vulcanizing apparatus for use in connection with microscopical work is described. Vulcanizing experiments on standard rubber-sulfur compounds are carried out to determine the applicability of the working method applied and results previously obtained by other research workers are checked. The vulcanization of non-sulfur containing compounds is studied and the most important differences are reported. A theory of vulcanization which correlates the effects found in sulphur and non-sulfur cures is outlined.

Some Observations on Rubbers with Low Nitrogen Content

A. D. CUMMINGS AND L. B. SEBRELL, *Goodyear Tire & Rubber Company*

It has been stated in the literature that nitrogen-free rubber has been prepared and vulcanized and that the vulcanizate had good physical properties. With but one or two exceptions no figures have been given for the amount of nitrogen such rubber contained. Data on the physical properties of such rubbers are also rare.

The present paper describes a series of experiments in which rubber was prepared with a nitrogen content of from .003 to .009 per cent. These different rubbers were made from latex according to the method of Pummerer. They were coagulatd at different pH values and the results obtained compared with another series of experiments recently carried out in this laboratory and which have already been published (I. E. C. **18** [1926], 1140).

The nitrogen-poor rubbers cure normally and do not show variations in cure as the rubbers of free nitrogen content coagulated under the same conditions. It is concluded that nature and character of the proteins were responsible for the differences observed in the first series of experiments.

The results of this work lend additional evidence to the fact that the proteins do not play as important a part in the tensile strength of rubber as was first thought to be the case. They do show, however, that the proteins and the various conditions in which they exist affect the rate of cure and the variability of rubber.

Speculation in the Rubber Market

SEVERAL interesting comments on the reason why the rubber market continues to be a favorite field for speculation and the extent to which this speculation is sometimes carried have been recently published in the August issue of the *Rubber Quarterly*, issued by the well-known Mincing Lane firm of Wm. Jas. & Hy. Thompson, London.

The role played by speculation in the affairs of the rubber market is not always clearly understood. The term itself covers two distinct species of transaction. The producer who sells in advance instead of waiting till his rubber arrives, the manufacturer who buys forward, the dealer who "hedges" either way—all are speculators in the strict sense of the word, but their "speculation" is in the nature of an insurance against the vagaries of trade, and in no way merits reproach.

The outside speculator—the individual or group who neither produces, deals in, nor manufactures rubber—is clearly in a different category since his "speculation" has much of the nature of a gamble. In the business world he generally comes in for considerable abuse, but the harm he does to legitimate trade interests is seldom precisely defined and in treatises on pure economics he has even obtained a certain qualified approval. The attitude of the economist towards the speculator, indeed, is of sufficient interest to warrant further description.

Authorities in the field of economics have sometimes defined speculation as synonymous with foresight, and that by its action all abrupt transactions, from scarcity to abundance and from abundance to scarcity, were avoided. That its existence was beneficial, in fact indispensable to organized marketing, is strongly affirmed, while admitting that from time to time it might give rise to undesirable consequences.

Such are the views of scientific observers with regard to speculation in the abstract. With regard more particularly to conditions in the rubber market, a number of further points may be made. The outside speculator in the commodity is, as a rule, markedly in evidence only when the market is active. In other words, he is not a constant factor, and there are periods, frequently of many weeks' duration, in which he is a negligible quantity. He is almost always a "bull," and therefore tends to raise prices above their economic level, as was the case in the boom of 1925. On the other hand, as he must inevitably sell, sooner or later, either to realize his profit or limit his loss, it may be argued that he exercises, *in the long run*, a steadying effect. The same argument applies to the bear, who must ultimately close his transaction by buying. The counter-argument is, of course, that both bull and bear accentuate fluctuations *in the short run*.

The successful speculator takes money out of the market; the unsuccessful speculator helps to finance the market.

Balancing the good against the evil consequences of speculation, it will generally be agreed that to "abolish" speculation is not practical politics under present-day conditions. The most profitable line of action would seem to be to endeavor, while retaining the many benefits conferred by the practice on the market as a whole, to limit the scope within which deliberately selfish manipulators can operate and to reduce the possibility of more honest misjudgment by steady improvement in the market's intelligence system.

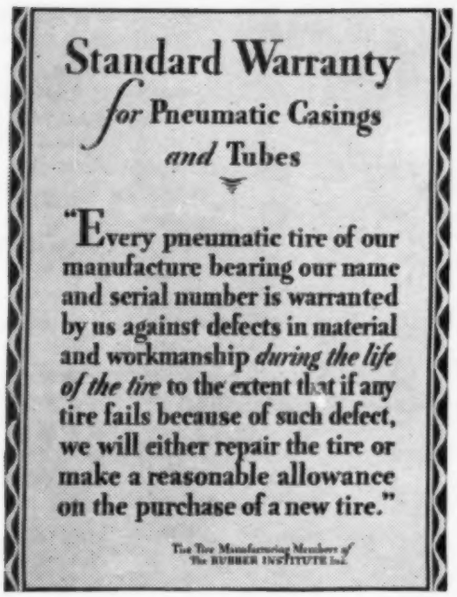
Use of Linerette Expanding

THE separator paper called Linerette, developed by the Cleveland Liner and Manufacturing Company, 5508 Maurice Avenue, Cleveland, Ohio, continues to show an ever-widening use as is evidenced by the 84 per cent increase in sales which its manufacturers report for the first seven months of 1928 compared with the corresponding period of last year.

This paper has been adopted by leading rubber manufacturers for use in separating stocks such as friction calendered stocks, in plying up stock by the drum method, between layers of fleece and wool linings, in footwear pipings, and in stock which is to be cut by dies such as for valve stem patches, etc. Numerous other applications have been found for this economical paper in preventing adhesion of various stocks. Linerette is furnished in several widths.

The Blue Processed Liners, produced by the same concern, continue to show a steady increase every year, having been accepted as a standard by many rubber manufacturers in this country and abroad.

The Government of Ceylon is giving strong support to agricultural research in the island. The Ceylon Legislative Council has sanctioned a loan of 1,000,000 rupees to the Tea Research Institute and is considering the granting of further loans for research into other important agricultural products of the island, including rubber.


Standard Warranty
for Pneumatic Casings
and Tubes
"Every pneumatic tire of our manufacture bearing our name and serial number is warranted by us against defects in material and workmanship during the life of the tire to the extent that if any tire fails because of such defect, we will either repair the tire or make a reasonable allowance on the purchase of a new tire."
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Akron Equipment Molds
Quality Good Workmanship Service

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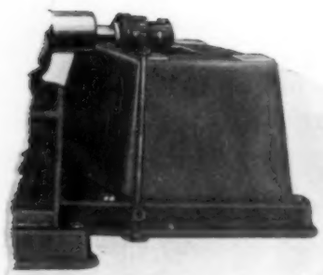

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EDITORIAL COMMENT

Optimism Again Prevails

THE anxiety in the crude rubber market over the possible turn of events after November 1 seems to have quieted down and the authorities in Mincing Lane and South William street are less pessimistic in their prognostications. The market has experienced a mild revision of sentiment and while the uncertainties of the market generally are contributing to keep the price level down, the sentiment is expressed from more than one authoritative source that the low level for the year would seem to have been about reached.

The factor that is stimulating such sentiment is the undiminished demand which is coming from manufacturing plants for crude rubber and the highly speculative nature of the rubber market in general at this time when the various stock exchanges are having record trading days in spite of high money rates.

The census of available stocks in British Malaya as of July 31 shows that surplus accumulations have not yet reached alarming proportions. Stocks in London continue to decline. Reports from the industry would seem to give assurance that consumption is not falling off from the high records established in June and July. Automobile production is continuing at record levels. The usual general apprehension over the presidential election this year has not yet appeared in the industry. The occasion, therefore, would seem to be 'an auspicious one' for a continuation of the present era of fair prosperity which is being reported from all rubber manufacturing centers.

Inventory Losses

A COURAGEOUS stand has been taken by the majority of the rubber manufacturing companies in their semi-annual financial reports by taking all of their inventory losses on crude rubber into their first six months' profit and loss accounts at one swoop. The situation is admirable even though it is lean from the standpoint of dividends.

On the other hand, it would seem not quite in keeping with logical accounting practice that the inevitable fluctuations in raw material prices should necessitate such sudden and severe losses. A more reasonable way of adjusting this hardship would seem to be called for.

Whether such a way could be worked out satisfactorily through contingent funds regularly set aside for the purpose or in some other manner is the problem of each individual company, but a step in this direction would certainly give more stability to the industry.

The Philippines Again

WITH the announcement during the last fortnight that the Goodyear Tire & Rubber Company has incorporated a plantation company in the Philippines, the question of the development of those Islands as a future source of rubber again comes to the front. Co-incident with the Goodyear move comes the news that the Philippine legislature is at last expected to act favorably on a bill to amend the land laws to permit the holding of a large enough acreage to make a plantation development economically profitable. It is needless to call attention to the economic advantages to the Islands in the event that plantation projects were undertaken there on a large scale. It is still difficult to understand the continued short-sighted policy which has so far prevented the Filipinos from enjoying the economic prosperity obtainable by the utilization of their rich public lands. Their aspirations for political independence are to be admired but could best be fostered by the Filipinos demonstrating their ability for economic independence. A step in the latter direction would be the prompt passage of the proposed land law amendment.

The Chemists Get Together

THE program for the annual fall meeting of the Rubber Division of the American Chemical Society shows a wide variety of subjects to be discussed and is indicative of the wide importance of rubber chemistry and technology and the influence which chemical science is increasingly exerting on the rubber industry. The meetings this year at Swampscott, Mass., will contribute a valuable fund of information to the rubber industry and should be an event well worth a 100 per cent attendance of rubber chemists and technologists. With the fall coming on, the group meetings of the Rubber Division of the Society will also begin. It is promised that the high standard set at these meetings last year will be maintained and the sessions will accordingly be watched with keen interest by the entire industry.

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NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

JULY RUBBER EXPORTS APPROACH YEAR'S PEAK

Despite Decline in Foreign Sales of Automotive Products, Record Exports of Rubber Footwear Make Month's Total Second Only to March.

AMERICAN exports of rubber products during the month of July were 2 per cent above the total for June and reached the highest figure for this year with the single exception of the record month of March. July exports totaled $6,100,000 in value as compared with the peak figures of $6,900,000 for March.

This high total was attained despite a falling off of 6 per cent in the value of automotive rubber goods exported. The decline in foreign sales of casings was responsible for the decrease for solid automobile tires exported increased in value 16 per cent over the June figures. During July the value of all automotive rubber products exported amounted to $3,226,195 as against $3,418,954 for June.

The principal cause for the greater export total was a tremendous increase in rubber footwear exports to a value of $1,134,600, the highest figure so far obtained in any month since the abnormal period of 1920. The July totals for footwear were 30 per cent higher than for June and represented gains in all items except rubber heels and soles which declined slightly. Exports of rubber boots registered an increase of 127 per cent over the preceding month.

Mechanical Goods Show Gain

Exports of mechanical rubber goods for July were valued at $640,283, an increase of 13 per cent as compared with June, while miscellaneous rubber goods were valued at $1,132,931, an increase of 7 per cent.

Argentina, which has always been a leading market for American automotive rubber products, fell far behind during July. Japan came into first place as an export market, taking 7 per cent of the total value of all automotive rubber goods exported. Hawaii was second with 6 per cent of the total and Spain third with 5 per cent. The trend of this export market showed a decided trend toward the Pacific for the first time. Not only were Japan and Hawaii the leading consumers, but the Philippine Islands and India ranked high among the principal American export markets.

Aetna Rubber to Build

The Aetna Rubber Company, Ashtabula, O., manufacturers of hard and soft-molded rubber products, has plans in progress for new plant units. Three one-story structures, to cost about $100,000 with equipment, are included in the company's building program. S. T. Campbell is president of the firm.

MILLHOFF RESIGNS AS MILLER SALES MANAGER

F. C. Millhoff, general sales manager of the Miller Rubber Company for 16 years and more recently manager of the car and truck manufacturers' sales, announced his resignation from the organization on August

F. C. MILLHOFF

23. He has made no plans for the immediate future other than to take a long rest. No announcement has as yet been made with regard to the appointment of a successor to his position.

Mr. Millhoff was born in Akron on July 4, 1876, and has lived there practically all his life. His first work, after being graduated from the city's elementary and high schools, was in the tailoring trade from which he went to the English Woolen Mills and became manager of their plant at Louisville, Ky.

Returning to his native town, he opened a tailoring shop opposite the B. F. Goodrich factory, but became so impressed with the future of the rubber industry that he left his first trade to organize the M. & M. Manufacturing Company for the purpose of making cement and acids for rubber manufacturers. Officials of the Miller Rubber Company recognized his ability as a salesman and in 1911 he accepted their offer of the position of sales manager in the tire department. Since that time his advancement in the employ of the Miller organization was rapid.

CHEMICAL ENGINEERS VISIT AKRON PLANTS

Party of 50 American and 150 British Chemists Make Thorough Inspection Tour of Rubber Factories in the Akron District to Study Industrial Methods.

UNDER the auspices of the Institution of Chemical Engineers of Great Britain and the American Institute of Chemical Engineers, a group of 200 chemists made a tour of inspection of Akron rubber factories on August 27. The party included 50 American and 150 British chemical engineers.

In the morning the chemists split into three divisions and visited the plants of the Goodyear Tire & Rubber Company, the B. F. Goodrich Company and the Firestone Tire & Rubber Company. Members of the party were entertained in the aftrenoon by Mrs. F. A. Seiberling at a garden party at her home, Stan Hywet Hall.

The visiting chemists were honored in the evening with a dinner at the Portage Country Club. The speakers at this affair included James D. Tew, president of the B. F. Goodrich Company; Edwin W. Brouse of Akron; E. R. Weidlein, director of the Mellon Institute and president of the American Institute of Chemical Engineers; Sir Alexander Gibb, president of the British Institution, and other distinguished chemists.

Akron is First City Visited

Akron was the first city to be visited by the group in their itinerary through the United States. Following their reception at the rubber factories, the chemists left for Pittsburgh. Other cities included in their trip are Wilmington, Del., Washington, D. C., and New York.

The committee in charge of the party's reception at Akron was headed by George Oenslager, research chemist of the B. F. Goodrich Company, and comprised Earl B. Babcock, chief chemist of the Firestone Tire & Rubber Company; Clayton W. Bedford, chemist of the B. F. Goodrich Company; R. P. Dinsmore, chief chemist of the Goodyear Tire & Rubber Company; Webster N. Jones, Akron chemist; Dr. Harlan L. Trumbull, W. F. Zimmerle, and H. A. Galt, chemists of the Goodyear organization.

Firestone Gives Essay Prize

The $4,000 scholarship in the national essay contest on "The Relation of Improved Highways to Education," conducted annually by Harvey S. Firestone, president of the Firestone Tire & Rubber Company, was awarded this year to Miss Verona Daniel Hardey, fifteen years old, of Gulfport, Miss. Her essay was selected from among thousands submitted by high school students of the United States.

SEIBERLING WORKERS HAVE ANNUAL FACTORY PICNIC

More than 7,000 persons filled Summit Beach Park on the occasion of the annual outing for employes of the Seiberling Rubber Company, Barberton, O., and their families, held on August 27. Aside from the usual program of sports, picnic luncheons and rides on the various park amusements, a bathing beauty contest featured the afternoon, the winners being awarded prizes by C. W. Seiberling, vice-president of the company.

Mr. Seiberling, Frank Baughman and Edward Cramp acted as judges of the various athletic and swimming events, while the picnic committee consisted of W. M. Mapes, chairman; J. R. Crossman and F. B. Calvin. Others who assisted in various details were F. H. Griffin, N. H. Peters, C. E. Jones, George Acker, Janet Beltick, P. Myers, Marjorie Baughman, Maude Shylock, W. Andrews, Glenn Carrier, E. R. Gibson and F. N. Clerkner.

A baseball game between the office and factory teams was a feature of the early afternoon, and dancing in the park pavilions occupied the latter part of the day. Buses took the employes and their families from the factory grounds to the park.

FIRE AT GIANT FACTORY CAUSES SLIGHT DAMAGE

A small blaze was caused by a short circuit in a motor which furnishes power for a cement mixer at the factory of the Giant Tire & Rubber Company, Findlay, O., on August 22. The fire had gained considerable headway before it was noticed by workmen, but fire department apparatus and the efforts of employes soon had it under control. The damage done was said to have been slight.

Name Plant Representatives

The tenth annual election of Goodyear Tire & Rubber Company industrial assemblymen will be held on October 8 when 40 "representatives" and 10 "senators" will be named. Primaries will be held on September 17, three weeks before the final election. Qualifications for candidates and apportionment of factory districts have been drawn up and petitions of candidates for nomination will be received for two weeks.

SALEM CORD TIRE PLANT OPERATING AT CAPACITY

Operating close to capacity, the factories of the Salem Cord Tire Company at Salem, O., are now maintaining a production of approximately 1,000 casings a day, together with heavy production of tubes, a product recently introduced to the Salem plant. The outlook for the fall months is declared by company executives to be unusually encouraging inasmuch as new connections have just been made for the firm's secondary tire line and indications point toward heavier shipments during September.

NORTHERN RUBBER HEADS CELEBRATE OUTPUT MARK

In celebration of a new production record set during the week of August 13 to 18, officers and factory foremen of the Northern Rubber Company, Barberton, O., were guests of the firm at a stag banquet held at Riehl's Inn on the evening of August 22.

All records for tire building, shipments and sales for the organization were broken during the week and new marks set, according to officials. The program of the affair was entirely informal and about 25 were present.

GOODYEAR DIRGIBLE AT NEW AIRPORT DEDICATION

The Puritan, new dirigible of the Goodyear Tire & Rubber Company, participated in the dedication of the newly established airport at Defiance, O., on September 6. The formal dedication services at the airport were held Labor Day, but a special program was conducted upon the airship's arrival.

On August 29 the Puritan flew over grounds of the Ohio state fair at Columbus with Jack Boettner, pilot, a Columbus newspaperman and several Goodyear officials as passengers. During the week it visited Dayton, Cincinnati, Toledo and Bowmanville, Ont., where one of the Goodyear plants is located.

J. Bonbright Anderson

J. Bonbright Anderson, president and treasurer of the Anderson Rubber Company, Akron, O., died at his home in Lakewood, O., on August 26 after an extended illness. Funeral services were held two days later with burial at the Lakewood Cemetery. Mr. Anderson, who was 55 years of age, is survived by a widow and two children.

Joseph L. Bartine

After a lengthy illness, Joseph L. Bartine, formerly vice-president of the Luzerne Rubber Company, Trenton, N. J., died at his home in that city on August 5. He was 77 years of age.

Mr. Bartine came to Trenton from Philadelphia in 1894 and for several years was affiliated with the Luzerne Rubber Company, selling out his interests in 1914. He was a native of Philadelphia and the son of the Rev. David Wesley Bartine and Amelia Stout Bartine of that city.

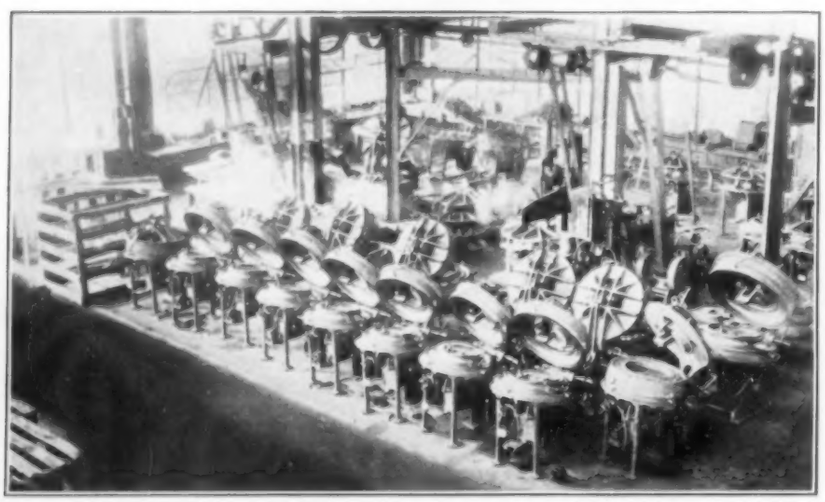
Thomas A. Linnane

Following an operation for appendicitis, Thomas A. Linnane, general superintendent of the Goodyear Tire & Rubber Company plant at Wolherhampton, England, died in a Wolverhampton hospital on the night of August 23. A resident of Akron practically all his life, he had been with Goodyear since 1911, prior to which he was connected with the Diamond Rubber Company and with the Whitman & Barnes Company.

Mr. Linnane entered the Goodyear company in the capacity of supervisor and was soon promoted to foreman and to general foreman. After serving in the latter position several years, he was made division superintendent in charge of production. He introduced many factory systems that increased production efficiency, among them being the factory specification system. During the war he won national prominence with his work in charge of Goodyear's war material production.

Early in 1927 he selected the site of the English Goodyear factory at Wolverhampton and, when it was completed, he was sent to England to head the activities of a large group of Akron workers who accepted posts at the new plant.

Operating Fifteen Presses With One Man



THE accompanying photograph shows one corner of the newly arranged erecting and testing shop of De Mattia Brothers, Inc., at Clifton, N. J., one of the units of the National Rubber Machinery Company.

In the foreground may be seen 15 De Mattia molded tube presses in all sizes from 4.40 to large truck type tubes. Through the adoption of the electric timing device of De Mattia Brothers, which automatically completes the operation of the mold after it has been closed, and with the De Mattia type of air connection used, it is interesting to note that one man can easily operate the entire number of presses shown.

FIRESTONE OFFICIALS OPEN NEW GOLF COURSE

The first nine holes of the 36-hole golf course being constructed by the Firestone Tire & Rubber Company south of the Tuscarawas River, Akron, were opened for play on August 11. It will be run by the Firestone Golf Club, the second largest organization of its kind in the state of Ohio.

The first stroke on the new course was made by Harvey S. Firestone, Sr., as the opening shot of a foursome consisting of himself, Mayor G. Lloyd Weil of Akron, John W. Thomas, vice-president of the company, and Roger Firestone. The course was opened two days later for Firestone employes, residents of Firestone Park and their guests.

A temporary clubhouse equipped with showers and lockers is situated near the first tee of the course. Wilson Crain, former Cleveland professional, will act as instructor for the club.

GOODYEAR LEGION POST AT STATE CONVENTION

Members of Akron Post, No. 209, American Legion, went to Columbus August 19 for the annual state convention of the organization. The post, which is composed entirely of employes of the Goodyear Tire & Rubber Company, was accompanied by its drum corps.

A parade through the streets of Columbus and a special concert for the Columbus Goodyear branch were some of the features of the occasion. The state Legion convention in 1929 will be held at Akron.

DAYTON RUBBER COMPANY SHOWS INCREASED SALES

The business of the Dayton Rubber Manufacturing Company for the first seven months of 1928 has shown steady increases in production and sales, according to John A. MacMillan, president and general manager. The net profit on sales for July alone amounted to 12 per cent and indicates that the net profit for the entire year will be 10 per cent of sales or better. Actual figures were not made public.

The unit sales on tires and tubes showed an increase of 21.65 per cent over the same period last year, Mr. MacMillan reports, and the net profit on sales for the seven months' period was 9 per cent. This was figured after adjustments of inventory and crude rubber to a 20-cent basis and after setting up ample reserves for depreciation, rebates to dealers for the previous 30 days' purchases because of the decline in tire prices, and setting up reserves for federal and other taxes.

Mr. MacMillan also states that despite the fact that the production capacity of the plant in 1928 had been increased 50 per cent over 1927, they have been compelled for several months to operate three eight-hour shifts continuously, producing 2,500 or more tires and 3,000 or more tubes daily. Additional mills and mold and vulcanizing equipment have been ordered and should be installed this month to increase still further the factory's capacity.

AKRON COMES TO BROADWAY

A scene from "The Big Pond," a new dramatic production with the rubber industry of Akron as its locale. The players in the picture are Reed Brown, Jr., Kenneth MacKenna, Harlan Briggs and Lucile Nikolas

SCHACHT COMPANY BUYS STEINBRENNER FACTORY

The Schacht Rubber Manufacturing Company, Huntington, Ind., has purchased the plant of the defunct Steinbrenner Rubber Company at Noblesville, Ind., for a consideration of approximately $67,500. The purchase was made at a receiver's sale, and the creditors of the Steinbrenner firm were represented by John Owens of Noblesville, who has acted as receiver for the past two years.

By the addition of the new factory, the Schacht company will be one of the most extensive manufacturers of small rubber goods in the world, according to William F. Schacht president. The Huntington factory is making 500 different articles at the present time, and the Noblesville plant will be used for specializing in the manufacture of fruit jar rings. Great increases in business made it impossible for the firm to handle all its production in one plant.

The old Steinbrenner factory at Noblesville is on four acres of land, and the 1926 appraisal gave it a valuation of $448,000. Practically all the equipment except tire manufacturing machinery will be used by the Schacht company, and much more new machinery will be purchased. The Noblesville plant is also equipped with a power plant valued at $58,000.

$50,000 BLAZE SWEEPS GOODYEAR DIPPING ROOM

A fire, unofficially estimated to have caused $50,000 damage, swept a bead dipping room on the fourth floor of Plant No. 2 of the Goodyear Tire & Rubber Company at Akron during the morning of September 1. Static electricity is believed to have caused the blaze which was discovered when cement in one of the dipping tanks burst into flames. The highly inflammable cement spread flames to other tanks and swept out through the windows.

All available chemicals were used up by employes and city fire apparatus played water upon the blaze for some time before the flames subsided. Most of the damage was caused by thousands of gallons of water seeping to the floor below and damaging tire stock.

COMMANDER HUNSAKER IS NEW GOODYEAR OFFICIAL

Commander J. C. Hunsaker, formerly of the United States Navy, has been elected a vice-president of the Goodyear-Zepplin Corporation, according to an announcement made August 29 by P. W. Litchfield, president of the Goodyear Tire & Rubber Company and its aeronautical subsidiary. Research and the development of commercial relations for the airship concern will be the chief duties of the new vice-president.

Commander Hunsaker, who was an outstanding figure in naval aeronautics when he resigned from the Navy last year, was born in Preston, Ia., in 1886 and was graduated from the United States Naval Academy at Annapolis and from the Massachusetts Institute of Technology. Until recently he was a research engineer for the Bell Telephone Laboratories in New York City.

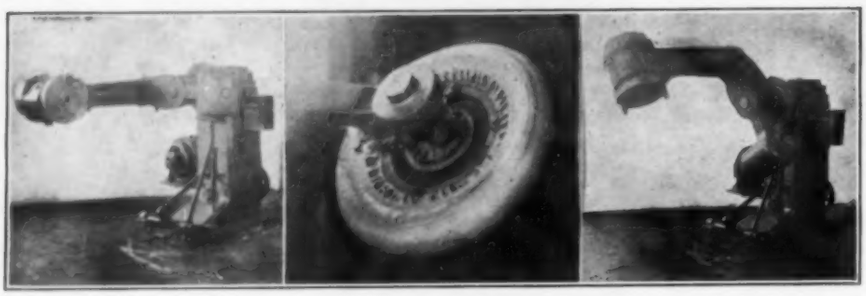
During his work in charge of the aircraft division of the bureau of construction and repair of the Navy Department Commander Hunsaker had responsibility for the naval aircraft war program and assisted in the design of the first non-rigid airships produced in this country as well as the rigid airship Shenandoah and the NC flying boats which first spanned the Atlantic.

He was chief of the design division of the bureau of aeronautics from 1921 to 1923 and has been a member of several Navy technical boards, the Interallied Naval Armistice Commission, and was for a while naval attache at the American embassy in London.

The Watkins Tubeless Tire Corporation of 632 Kaighn Avenue, Camden, N. J., has been incorporated at Trenton with a capital of $15,000 to manufacture cord and balloon tires and tubes. The incorporators are John H. Royall and John Aschenbach of Philadelphia, and John H. Landau of Camden.

CATALPO!

New Giant Power Stand Made by De Mattia Brothers



DE MATTIA Brothers, Inc., of Clifton, N. J., one of the units of the National Rubber Machinery Company, is offering to the trade a new giant power stand for the building of heavy duty tires.

The machine is in reality a double, extra-heavy, turn-over hand building stand with power applied to the spindle carrying the building form. The unit is driven by a 2 H. P., 1,800 r.p.m. motor through a silent chain drive and change gears, permitting two different speeds on the spindle.

The motor is controlled by a safety oil switch, while the speed change is controlled by foot pedals convenient to the operator. Two of the accompanying views show the machine proper in different operating positions, while the other one shows how the tire may be held in a convenient position for building.

GOODYEAR TO CONSTRUCT NEW ADDITION TO PLANT

Details are now being worked out for the construction of a new four-story building to augment the facilities of the plant of the Goodyear Tire & Rubber Company of Canada at New Toronto, Ont. It is expected that the new structure will be erected on the lake shore adjoining the present plant before the end of the fall.

According to President C. H. Carlisle, the present factory is unable to meet the demand for its product, although approximately 9,200 tires are being turned out daily, an increase in production of 26 per cent over last year. With the increased facilities of the new plant, it is estimated that nearly 12,000 tires daily will be manufactured.

CHESTER CORD TIRE IS TO SUSPEND PRODUCTION

All operations have been suspended indefinitely at the factories of the Chester Cord Tire Corporation at Chester, W. Va., it was announced last week. The plant has been operating under a receivership for the past several months and lack of satisfactory financial backing is given as the reason for shutting down.

O. O. Allison, the receiver, has made no announcement as to the future of the concern except to say that some tires that still remain on hand will be shipped immediately. The company formerly manufactured "Superior" and "Crane" cord tires. It is said that all executives of the firm have become identified with the rubber tire industry elsewhere.

CATALPO!

SWAN RIVER TIRE FIRM TO REMAIN AT BUCYRUS

The Swan River Tire & Rubber Company, manufacturers of mechanical rubber goods, which established operations in the plant of the old Rufenacht Rubber Company at Bucyrus, O., last November, will continue production in that city, it was announced on August 30. Negotiations for the purchase of the plant of the defunct Wildman Tire & Rubber Company at Port Clinton have been dropped.

"Our force of workmen is being steadily increased," says O. B. Keplinger, president of the company, "and by October 15 we will have 75 men employed. We have contracts for and are now equipping our plant to manufacture radiator hose and body strips for the Hupmobile, Chevrolet, Pontiac, Hudson, Oakland, Ford and Overland automobile companies. Additional business is being secured from Chicago, Philadelphia, Cleveland and Toledo."

BLACKHAWK TIRE PLANT WILL BE OPENED AGAIN

The factory of the Blackhawk Tire & Rubber Company, Des Moines, Ia., has been purchased for $45,500 by a group of men represented by John Connolly, Jr., and will soon be reopened on a full production basis. The sale was made by the receiver of the firm after it had been declared in bankruptcy by the federal courts.

The Blackhawk plant occupies a two-story brick building with trackage facilities and is said to be one of the most modern factories in the Middle West for the manufacture of tires and tubes. It was built a few years ago and fully equipped with up-to-date machinery at a cost in excess of $150,000. A mortgage for $27,500, held by the defunct Iowa Loan & Trust Company, is to be paid in full, while creditors with unsecured claims of $114,500 will share in less than $18,000 when the expenses of the receivership are paid.

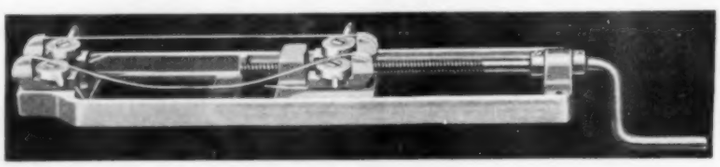
Mr. Connolly was secretary of the original company which was formed in 1919 with A. M. McColl as president and J. F. Griffin and Fred German as vice presidents. In addition to producing "Chief" cord tires and "Blackhawk" tires and tubes, the company manufactured tire repair materials and tube patches under the brand name of "Blackhawk."

NATIONAL RUBBER FIRMS INCORPORATED IN OHIO

Three of the constituent firms in the recently organized National Rubber Machinery Company have filed petitions with the secretary of state at Columbus, O., for incorporation to protect their individual names. They are the Banner Machine Company, Columbiana, the Kuhlke Machine Company and the Akron Rubber Mold & Machine Company, Akron.

All three firms were incorporated by Stanley W. Harris, M. D. Kuhlke and G. F. Hovak. Mr. Harris is president and Mr. Kuhlke treasurer of the National Rubber Machinery Company.

Demonstrating "Supertwist" Cord



THE Goodyear Tire & Rubber Company is employing a unique educational campaign in connection with their assertions of the superior qualities of the "Supertwist" cord, now being used in the construction of Goodyear tires.

A machine is used to demonstrate by actual tests the company's claim that "Supertwist" cords enable their tires to stand up under shocks of the road, without damage, while the cords of less strength used in other tires will break, causing faster wear. Testing machines for the purpose, similar to the one seen in the accompanying illustration, have been distributed to Goodyear dealers and the demonstration is made before the prospective customer's eyes.

A strand of ordinary cord and a strand of "Supertwist" cord are placed in the machine and stretched taut at equal tension by means of turning the handle on the machine. The illustration shows what happens, as claimed by the company, after the cords have been released to the original tenson. It is claimed that the ordinary cord will have sagged and become lifeless, while the "Supertwist" cord remains taut. The final step in the test consists of stretching both cords until they break. The "Supertwist" cord, it is claimed, will stretch 20 per cent. farther than the ordinary cord before breaking.

REGISTRATION OPENED AT GOODYEAR SCHOOL

Goodyear Industrial University will open again for the fall and winter season on September 17 with a course of studies specially adapted to interest the employes of the Akron rubber firm. Registration for these courses has been going on since August 29 and it is expected that several hundred will be enrolled when the school is actually opened.

Complete courses in accounting, industrial management and sales are offered in the school of business, and comptometer, stenographic and secretarial courses are also offered. A one-year preparatory course in English and arithmetic is included in the curriculum, and a general course in engineering may be had in the school of engineering. Numerous supplementary courses are also provided.

There is a very low charge made to employes taking these courses and substantial refunds are returned to those who complete their work.

RUBBER COMPANY LEASES FACTORY IN NEW JERSEY

The Devine Rubber Company of New Brunswick, N. J., has leased a large factory building in Boonton, N. J., and will commence operations there in October. The factory was formerly used for the manufacture of silks by the Polgram & Myer Company.

More than 50 men and women will be employed in the plant when the rubber company starts production. This marks the first step by the members of the Boonton Chamber of Commerce in a campaign to bring manufacturers to their community. Members of the chamber, headed by Harry A. Griffith, subscribed for $25,000 in stock in the rubber company as an inducement to bring it to Boonton.

OAK TIRE & RUBBER CO. IS BOUGHT BY NEW FIRM

The plant formerly occupied by the Oak Tire & Rubber Company at Oakville, Quebec, is reported to have been taken over by a new company known as the General Tire Corporation. The new organization is at present producing only tubes but expects to have the factory in shape soon for the manufacture of casings.

While the new company has no connection with the General Tire & Rubber Company of the United States, it is reported that American capital is backing its operations.

Hose Specifications Proposed

The Federal Specifications Board, an interdepartmental bureau for the coordination of government specifications, has drawn up detailed recommendations for the future purchases of braided water hose and rubber tubing. The proposed specifications for water hose are new but the tubing specifications are a revision of former recommendations.

Barr Rubber Plant Burns

The factories of the Barr Rubber Products Company at Sandusky, O., were completely destroyed by fire on September 6. The company was one of the largest manufacturers of toy balloons and other novelties in the United States. No announcement has as yet been made by company officials as to plans for rebuilding the plant.

NATIONAL TIRE DEALERS TO CONVENE IN BOSTON

The ninth annual convention of the National Tire Dealers' Association, Inc., will open at the Statler Hotel, Boston, on November 19 and will last to the 22nd. The afternoon program for the first day includes a sightseeing tour following which delegates will be the guests of Frederic C. Hood, president of the Hood Rubber Products Company, at a dinner and entertainment at the Hood factory.

The tentative program includes addresses on the second and third days of the convention by A. E. Feragen of the Motor Wheel Corporation; Harry Moock of the Automotive Equipment Association; Roger Babson, business and financial expert; Director General Lincoln C. Andrews, of the Rubber Institute; and Frederic C. Hood. Officers will be elected and general business transacted on the final day.

ACCESSORY BUSINESS AT HIGH LEVEL FOR VOLUME

The automotive parts and accessory industry had another record month in July with sales not only exceeding previous July aggregates but also slightly above the June levels, according to the Motor and Accessory Manufacturers' Association. Association members reporting had an aggregate July volume of shipments on a dollar basis of 187 per cent of January, 1925, the base index used in the compilations, as compared with 185 per cent in June and 143 per cent in July last year.

Approximately 150 members of the association, making more than 100 classes of products, are now serving the aircraft industry or have placed themselves in a position to do so. Their products run all the way from complete motors down to the smallest washers, nuts and bolts and include many accessory items such as indicating devices, oil and air purification systems and lighting apparatus.

Progress is reported by the committees arranging the details of the merger of the Motor and Accessory Manufacturers' Association with the Automotive Equipment Association. According to J. M. McComb, president of the former, the amalgamation plans in full will be referred to the membership of both groups this fall.

De Mattia Employes Enjoy Annual Outing

MORE than 200 employes of De Mattia Brothers, Inc., one of the units of the National Rubber Machinery Company, enjoyed themselves at the fourth annual outing of the organization, held on August 18 at an old inn on the Saddle River. Buses took the workers from the factory at Clifton, N. J., through Passaic to the picnic grounds.

In the morning the married men of the company were victorious over the single men in a close baseball game and during the afternoon various athletic events were conducted, including a sack race, a three-legged race, a fat men's race, and a tug-of-war between the machine shop and foundry employes. During the dinner session, R. W. Grant of the engineering department, on behalf of the foundry and machine shop workers, presented Peter and Barthold De Mattia with works of art sculptured in marble.

Timely Financial News

AJAX RUBBER DEFICIT LESS THAN LAST YEAR

Loss Reported for the First Six Months of 1928 Is $846,001 After Interest, Depreciation and Write-Down of Inventory.

THAT the operations of the Ajax Rubber Company and its subsidiaries for the six months ending June 30 resulted in a net loss of $846,001 is reported in the company's semi-annual financial statement. This represents a smaller loss than its deficit for the corresponding period of last year which amounted to $861,158. During the first half of 1926 the company made a profit of $74,279.

The deficit registered in this year's report is made after interest, depreciation and write-downs of inventory losses on crude rubber. The Ajax company was affected in the same manner as all other rubber manufacturers by the drastic decline in the market prices of crude rubber which followed the announcement that British restrictions would be withdrawn after October. Price decline rebates and loss from write-down of inventories in excess of reserve provided amounted to $271,562.

Property Account Increases

The company's consolidated balance sheet as of June 30 shows cash on hand of $944,842 as against the sum of $1,200,002 at the same time last year. The property account, however, has increased from $4,165,721 in 1927 to $5,209,155 in 1928 after depreciation. Valuation of goodwill and patents has been raised from $1,874,875, at which they stood from 1925 to 1927, to $2,184,875 this year, an advance of $310,000. The firm's investments have dropped from $505,874 in 1926 to $188,693 in 1927 and $22,651 in 1928.

The capital stock of the company, represented by 880,330 shares of no-par stock, is figured at $10,385,794.

AJAX RUBBER COMPANY
Consolidated Income Account

	1928	1927
Gross loss	$276,651	$537,457
Other income	57,086	97,890
Total loss	$219,565	$439,567
Interest, depreciation costs	354,874	421,591
Federal taxes	.....	.....
Inventory adjustments	†271,562	.....
Net loss	$846,001	$861,158

†Price decline rebates and loss from write-down of inventories in excess of reserve provided.

India Tire Pays Dividend

Directors of the India Tire & Rubber Company announced on August 30 that the regular quarterly dividend of 1¾ per cent had been declared upon preferred stock, payable on October 1 to stockholders of record as of September 20. It was also reported at the time that the company's financial position has improved materially during the past year, liabilities having decreased from $2,329,000 to $827,000. The present rate of current assets to liabilities is 2½ to 1, and the trend of business is said to be firm and steadily on the increase.

CATALPO!

RUBBER COMPANY STOCKS RISE TO HIGHER LEVELS

With few exceptions the stock issues of the various rubber manufacturing companies went to higher levels during the fortnight with fairly active interest shown in trading. On all exchanges the volume of transactions has been increasingly higher.

The fact that practically all rubber companies have written down their inventory losses for the first six months of the year has tended to inspire greater confidence in their stocks. The general feeling that all manufacturers will be in a substantially better financial position at the end of the second half has in a large measure been responsible for the advance in quotations.

The most sensational rise has been registered by Mohawk which advanced from 155 to 185 on the announcement of its admission to the Chicago Stock Exchange, but receded later to 170. News that U. S. Rubber expected a profit of close to $1,000,000 during July after its recent inventory devaluations caused its common shares to climb 7 points to 38½.

Late Stock Prices

	Last Price Sept. 4	Aug. 20	1928 High	1928 Low
Ajax	9	8	14⅜	7½
Firestone	176¼	170	232	170
do. 6% pfd.	109	110	112	109
do. 7% pfd.	—	110	111½	108
Fisk	11⅞	9¾	17¾	8⅞
do. 1st. pfd.	75½	63	91½	58½
General	—	165	190	165
do. pfd.	—	98	111	98
Goodrich	79	76	99⅜	68½
do. pfd.	111¾	112	115⅝	109½
Goodyear Com.	62	55⅜	72½	45⅛
do. pr. pfd.	—	99⅝	99½	92½
do. pfd.	—	—	120	100
Hood	29	27	43	25
India	54½	42	57⅜	16
Intercontinetnal	—	10	21¾	8⅛
Kelly Springfield	18⅞	19⅝	27⅜	15
do. 1st pfd.	—	—	80	58
do. 8% pfd.	—	—	84	55¼
Lee	19⅛	19⅜	24½	17¼
Miller	22⅛	18	27	18⅞
do. pfd.	—	79	97½	70
Mohawk	170	155	185	29¾
do. pfd.	—	79	95	55
Seiberling	46	45	49½	35
do. pfd.	—	—	107½	102
U. S. Rubber	38½	31½	63¼	27
do. pfd.	71½	61½	109⅜	55
U. S. Rubber Reclaiming Com.	—	—	16½	11½

MOHAWK RUBBER STOCKS PUT ON CHICAGO MARKET

The board of governors of the Chicago Stock Exchange voted on August 29 to admit the stocks of the Mohawk Rubber Company for the first time, causing both the common and preferred to go to new high marks. The common reached a peak of 185, while the preferred stock rose to 90.

The recent rise of Mohawk quotations to new high marks is attributed in market circles to anticipation of the listing on the Chicago exchange. Mohawk's earnings during July and August were equal to the company's entire earnings during the first half of 1928, it was said by R. E. Bloch, treasurer of the company. While July and August are always the heaviest months in business volume, he declared that the increase this year was unusual, being 40 per cent ahead of the same two month in 1927 in unit sales.

"Because of lower tire prices this year," Mr. Bloch said, "the increase in dollars and cents was about 28 per cent over the same period last year." He predicted that Mohawk common should pay from $28 to $30 a share this year as compared with $23.5 last year.

"Considerable Mohawk stock is owned in Chicago," Mr. Bloch stated, "and Chicago owners have been at a disadvantage in having to deal through the Cleveland exchange. The action of the Chicago exchange will give us a much broader range of distribution."

The rise of Mohawk common has been sensational since the beginning of the year when it closed at 20 on January 3. Its first great impetus came at the end of March when an $800,000 loan was negotiated from the Union Trust Company of Chicago. This was the result of refinancing plans involving the issuance of $800,000 gold debentures, secured by first mortgage notes, and the increase of common stock from 25,000 to 35,000 shares. The loan was made at a favorable rate of 6 per cent for a five-year period.

Upon the announcement of the loan, the stock shot up in a few weeks from 35 to 165, later receding to 130. Mohawk was one of the few rubber companies to show a profit for the first six months of 1928, and this fact, together with the expectation of its listing on the Chicago market, served to bring it up to new peak quotations.

AUBURN RUBBER COMPANY MERGER IS REPORTED

A rumor that the Auburn Rubber Company, Auburn, Ind., manufacturers of tires, tubes and rubber goods, has been merged with a group of about 50 industrial and utility companies controlled by Chicago and Minneapolis interests is current in Western financial circles and is not denied by officials of the firm.

AJAX TRENTON FACTORY MAY BE OPENED AGAIN

According to Edward M. P. Murphy, Inc., agents for the disposal of the plant, it is possible that the tire factory formerly operated at Trenton, N. J., by the Ajax Rubber Company may resume operations under new ownership. A group of Philadelphia tire engineers and promoters are said to be interested in purchasing the plant and operating it at full capacity.

Agents of the Philadelphia group have thoroughly inspected the equipment at the plant and are said to have found it ready for work to be started immediately. As this is one of the largest tire factories in the section, it will mean the employment of several hundred men if it resumes operations.

TIRE PRICES REDUCED TO CAR MANUFACTURERS

General reductions of from 6 to 10 per cent. on the price of automobile tires sold as original equipment to car manufacturers have been announced by the leading rubber companies. These reductions, which went into effect on September 1, apply solely to business done with motor car factories and do not in any way affect the price of replacement and dealer business.

U. S. RUBBER JULY SALES GAIN OVER 7 PER CENT

July sales of all classes of rubber goods by the United States Rubber Company showed a gain of 7.2 per cent over the corresponding month of 1927, it is reported, with a profit estimated at close to $1,000,000. These results are due chiefly to the action of the company in making a clean sweep of its inventory markdowns on June 30.

The company's tire division is operating close to capacity and the general outlook for the second half of the year is said to be better than it has been for some time. It is estimated that approximately 40 per cent of the $14,000,000 loss incurred in inventory depreciation and commitments in the Rubber Pool during the first half will be made up before the end of 1928.

Firestone Coast Plant Busy

The Los Angeles plant of the Firestone Tire & Rubber Company is now employing more than 400 men, according to R. J. Cope, general manager. By the end of September the factory will be in full operation and production will be greatly increased with further additions to the number of workers.

Fire Destroys Scrap Plant

A fire that started at noon on September 1 completely destroyed the East Akron warehouse of the Loewenthal Company, scrap rubber dealers and reclaimers, with a loss of $50,000. The building with floor space of approximately 10,000 square feet was burned to the ground and the blaze for a time threatened to spread to nearby oil tanks containing 150,000 gallons of gasoline.

Names in the News

F. D. GABLE, chief engineer, and BEN HERR, assistant sales manager of the General Tire & Rubber Company, were honor guests and speakers at the quarterly meeting of 25 southern representatives of the firm last month at Atlanta, Ga.

L. D. TOMPKINS, president of the General Tire & Rubber Company, has been appointed special representative of the president of the United States Rubber Company, of which General Rubber is a subsidiary, to represent the firm as a member of the Rubber Institute.

L. GREENWALD, manager of the coach and cab division of the Firestone Tire & Rubber Company, celebrated his completion of 20 years of service with the company on August 17, having joined the organization on that date in 1908.

J. J. FIGUEROA, director of E. Sole & Cia., Firestone distributors for Porto Rico, made a short business trip to Akron last month. A week after his departure, R. E. BASKERVILLE, Firestone's representative in the Philippines for the past two years, sailed for Porto Rico to make his headquarters with E. Sole & Cia.

R. A. TIMLIN, engineer of the Firestone Tire & Rubber Company, has just returned to Akron from Liberia where he has had a part in the development of the Cavilla Group near Cape Palmas.

W. E. DOWNS, for the past seven years with the C. Kenyon Company and the Vulcan Proofing Company, has joined the sales organization of the Naugatuck Chemical Company. For the present he will have his headquarters in the New York office at 1790 Broadway and will call on the rubber manufacturers in the Eastern territory.

MAURICE KEATING, representative of the Manchester-North Borneo Rubber Company, an English corporation, visited Cleveland and Akron last month. He is touring the United States in search of additional markets for crude rubber.

WARD GREENWAULT, formerly advertising manager of the Pennsylvania Rubber Company, is now in charge of the Chicago branch of the firm. He left to take up his new duties on August 22.

ROBERT CUMMING, for the past eighteen months a factory representative of the Empire Tire & Rubber Corporation, has been appointed manager of the company's new branch store at Elizabeth, N. J. He was formerly connected with the Guarantee Trust Company of New York, and served with the transport forces and with the Marine Corps during the war.

EARLE L. BRYANT, factory manager of the Hartford Rubber Works of the United States Rubber Company, will in the future act as head of the company's Detroit factory as well. L. B. MARTIN has been appointed superintendent of the Hartford plant.

ARTHUR E. MOON, of Yardley, Pa., secretary and treasurer of the Essex Rubber Company, Trenton, N. J., has recovered from his recent illness which confined him to a Philadelphia hospital.

THEODORE S. CART, secretary of the Pocono Rubber Cloth Company, Trenton, N. J., has returned after an extended vacation at Lake Placid, N. Y.

ROBERT J. STOKES, president of the Thermoid Rubber Company, passed a great part of the summer months with his family at Cape Cod.

GENERAL C. EDWARD MURRAY, formerly president of the Empire Tire & Rubber Corporation, was injured in an automobile accident recently while on his way to his summer home at Spring Lake, N. J. He suffered a bruised chest after another machine had crashed into his car.

CLIFFORD H. OAKLEY, president of the Essex Rubber Company, spent his vacation with the other members of his family in the Pocono Mountains.

CARL K. WOLLAM, veteran balloonist of the Goodyear Tire & Rubber Company, spoke on the need for better landing fields before the Akron Aero Club on August 30. He also recounted his experiences in the national balloon race at Pittsburgh last May.

L. R. VORCE has joined the Cleveland Liner & Manufacturing Company to act as research chemist in connection with their various products.

P. A. MEYER, office manager of the Goodyear Tire & Rubber Company branch at Buenos Aires, has returned there after a short visit in this country.

HERBERT A. ENDRES, rubber chemist, has joined the research staff of the B. F. Goodrich Company at Akron. He had been for a long time associated with the Celite Company, heat insulating material producers, located at Lompoc, Cal.

F. J. WILSON, president of the Wilson Rubber Company, Canton, O., has returned from his recent trip to the American Hospital Association convention at San Francisco. He made the trip home by way of the Canadian Rockies.

P. E. BRIEN, of the Columbus Rubber Co., Ltd., Montreal, Que., was recently elected to the position of secretary and treasurer of the Quebec Division of the Shoe and Leather Travelers' Association.

Rubber News Around the World

RUBBER RESEARCH BILL FAILS IN PARLIAMENT

Effort to Pass Provision for the Maintenance of the Rubber Research Association Is Dropped Because of Lack of Time as Session Ends.

OWING to lack of time at the end of the Parliamentary session, the British Rubber Industry Bill failed of passage a second time. The bill was first introduced by E. T. Campbell in 1927 but was not passed at that time for the same reason.

The bill, which provided for the collection of a contribution by rubber manufacturers to the funds of the Research Association of British Rubber and Tire Manufacturers had the general support of the rubber industry in the form in which it was finally passed by the standing committee to which ti had been referred. It was, however, strenuously opposed by a few members of the House of Commons.

Had there been time to consider the measure on one of the Fridays which are reserved for members' bills, it undoubtedly would have been passed into law. The Government, however, was unable to spare any time for the bill's final stages, and consequently it could make no progress. It will again be submitted at the next session and meanwhile its supporters are trying to win over those members who have declared their opposition to it.

In its final form the measure had for its object the collection of only £15,000 to maintain the association which has been in existence since 1920 through Government subsidies and voluntary contributions. In 1925 it received a block grant of £2,000, the grant diminishing by £400 each year, so that in 1929 the Research Association will be entirely without any Government aid whatsoever.

"The association," says Mr. Campbell, "has done very useful work in all kinds of research. It has isued a number of research reports which are at the disposal of the industry and numbers of laboratory circulars and three important reports relating to patent processes in the industry. It has also published a number of papers relating to standardized machinery used in the industry.

"The public in this country needs to be educated in the uses of rubber and, unless there is an up-to-date research station, with first class experts, I fear we shall fall behind America and the Continent."

New Rubber Soap Dish

A "limpet" soap dish that will not slip off the side of the bathtub has been introduced in England. Made of rubber, it has a base so designed that it adheres by suction wherever placed. The new dish is produced in an attractive shape and is finished in a variety of colors.

FORD WILL CONSTRUCT NEW ENGLISH FACTORY

Construction is to start immediately on the projected Ford plant on the Essex banks of the Thames. The factory, covering 30 acres of a 300-acre site at Dagenham, will be a replica on a smaller scale of the Detroit plant and will include blast furnaces, steel rolling mills and a large power station.

A large wharf will be built out into the river and several miles of railway sidings and roads will be laid down. To insure the safety of the foundations for the heavy plant and machinery, trial bore holes are being sunk in the site. When completed the new Ford works will completely transform the semi-rural aspect of these riverside flats.

RUBBER INSURANCE BANK SUGGESTED FOR MALAYA

A plan has been formulated for the formation of a rubber insurance bank in Malaya for which no capital would be required. The idea is contingent upon the co-operation of the governments of Malaya, the Dutch East Indies and Indo-China.

With the authority and assistance of these governments, the bank would impose a duty of three pence in the pound sterling on the value of all rubber exported. From the sum thus collected the bank would meet government demands for the payment of duty at the rate then in force, but it would be permissible for the exporter to meet his obligations toward the bank either in cash or by a deposit of rubber at a fixed valuation of a shilling a pound.

All the duty so paid, whether in cash or rubber, would be placed to the credit of the payers who would thus become shareholders in the organization. The latter would be run entirely for the benefit of the industry and would be free from any suspicion of private gain.

DUNLOP PLANT BUILDS WORLD'S LARGEST TIRES

The British Dunlop factories recently finished the construction of what are said to be the world's largest tires for the landing wheels of the Beardmore Inflexible, the biggest monoplane ever built. The tires are 7 feet, 6 inches, by 16 inches in size.

Dunlop also built the wheels in which a high tensile steel well-base rim and a central steel shell were connected with stiff radial plates of duralumin with disc sides also of duralumin, all riveted together. Both wheels and tires passed all tests and were successfully used in the plane's first flight.

EXCHANGE OPENS TRADE IN ADDITIONAL GRADES

Trading in a second contract, covering six additional grades of rubber, was inaugurated on the Rubber Exchange of New York on September 4. The new contract, designated as "BB," covers A, B, C and D blanket crepes and No. 1 and No. 2 brown crepes. The first two grades are deliverable at contract price, and the other four at differentials which are fixed monthly by the adjustment committee.

The first day's trading in "BB" contracts was light, but is expected to increase in the future. July was the only delivery in this division to receive any attention with total sales amounting to 6 contracts.

RETAIL RUBBER CHAIN ORGANIZED IN LONDON

Intensive efforts are being made by Reliance Rubberware, Ltd., the new British retail chain of rubberware stores to get its program under way. On June 9 it opened its first retail store at Kilburn, London, and a month later, opened new wholesale and export offices, warehouse facilities and a retail store in Aldersgate street, London. A third retail establishment was opened later in the West End Section, and others are scheduled to follow rapidly.

The firm's wholesale and export departments are expanding steadily with its products selling in all the chief markets of the world. New automatic hydraulic presses have been installed in the factory, and a special plant designed for the Reliance latex waterproofing process is being equipped.

Each of the retail branches exhibits a full line of rubber goods, including everything from rubber tacks and suction hose to waterproof bibs and rubber corsets. All are attractively displayed in appropriate sections of the shops and have thus far been creating favorable impressions on the public and making heavy sales.

Rubber Firm Leases Space

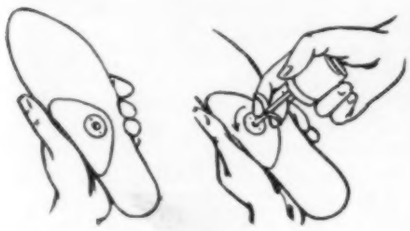
The Cambridge Rubber Sales Company has leased the ground floor, basement and sub-basement of the building at 123 Duane street, New York City. The company, which has occupied space in this building, now controls the corner with entrances on both Duane and Church streets. Expansion of the business was the cause for obtaining the additional space.

CATALPO!

Rubber Goods and Specialties

Pneumatic Arch Support

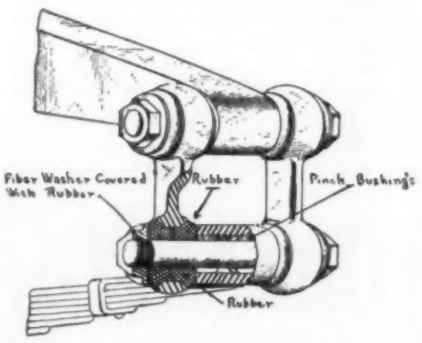
Having achieved a large volume of sales in Germany, this rubber pneumatic arch support, for which American patents have recently been granted, is now offered in this country. The Phillips Rubber Company, 10 High Street, Boston, Mass., is acting as



manufacturer's agent for Pneumette, Inc., 299 Broadway, New York City. As the arch support is filled with air by the use of a small pump, it can be made as thick as the individual's foot requires. The movement of the air in the pneumatic pad is said to massage the muscles at the bottom of the foot gently, thus being conducive to their increased strength and vitality. The pads are made for both the longitudinal and the metatarsal arch and are said to have been endorsed by chiropodists.

Rubber Spring Shackles

This shackle provides metal-to-rubber composition contact instead of the usual metal-to-metal contact and is, therefore, claimed to be noiseless. It is advertised as the Borst Rubber Shackle Shock Absorber and is manufactured by the Pau Jun Engineering Company, 795 Washington Street, Buffalo, N. Y. It resembles the ordinary metal shackle in appearance, but the shackle



bolt rests in vulcanized rubber composition spools, part of each spool being a fibre washer. The bolts are securely locked so that they do not move, and a sufficient amount of lubricant is included in the composition to reduce wear. Easy riding is claimed as a result of the shackle having a partial spring controlling action. Replacement installation may be made in about four hours.

Rubber Campaign Toys

Several of the novel inflated toys manufactured by the Rex Rubber & Novelty Company, 96 Warren Street, New York City, are having rapid sales because of their connection with the presidential campaign. Among these are the ones illustrated, representing the Democratic donkey, the Tammany tiger and the Republican elephant. All of these rubber toys are furnished with rolling eyes and with noise-making devices, if desired.

Exerciser and Massager

Under the name of the "Rekreator," this new exercising machine is being offered to the public by Luther, Inc., 286 South Water Street, Milwaukee, Wis. The user of the

apparatus reclines into the elastic rubber massage belt and lets the machine do the work, according to the manufacturers. Special efforts are being made by the makers to co-operate with dealers throughout the country in the way of circularizing prospective customers from the office of the company.

New Water Faucet

Leaky washers are eliminated by a new type of domestic water faucet recently introduced in England by the London Valve Company, Ltd. By acting on a flexible cone of special composite mixture with a rubber base and compounded to withstand high temperature, the water seals itself, no washers or seatings being used. Since the pressure of the water on the outside of the cone effects the closing, the tightness of the faucet is independent of the screwing down load, and the taps are interchangeable for hot or cold water.

Re-packing can be carried out while the spindle is in such a position that the tap does not run. Each washerless tap is tested by the makers at a hydraulic pressure of 450 pounds per square inch and is guaranteed for seven years against leakage.

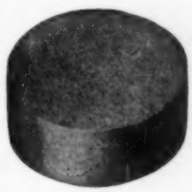
Rubber Sport Boat

Intended for use in fishing, hunting and camping, this pneumatic rubber boat is offered to sporting goods dealers by the Pneumatic Boat Corporation, 122 Branford Place, Newark, N. J. It can be packed into a bag that a man can carry with ease, but when

inflated is 10 feet, six inches, in length, and can carry 6 persons comfortably. With the aid of foot bellows, it can be inflated in 3 minutes and will then support 2,000 pounds safely.

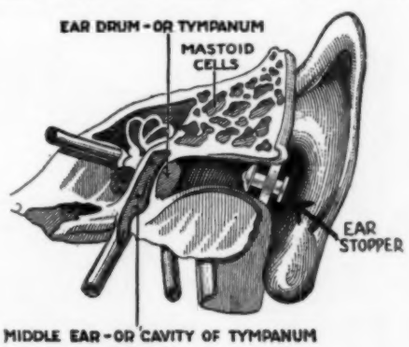
Colored Hockey Puck

Made of the regulation size and weight, this hockey puck being introduced by the Seamless Rubber Company, New Haven, Conn., manufacturers of druggists' and recreational rubber goods, has the novel feature of being painted a bright orange instead of the conventional black. The new puck is said by its makers to hold firmly to the ice, to lift nicely from the stick and to wear strongly without chipping.



Rubber Ear Stopples

These rubber ear stopples designed to permit natural hearing while at the same time shutting off loud noises or detonations are



being marketed by the Safety Ear Drum Protector Corporation, 131 W. 42nd Street, New York City, under the name of "Solitude Silencers." They are said to fit any ear and to be perfectly sanitary and easily cleaned with soap and water. According to the manufacturers, they were used by members of the crew on Miss Amelia Earhart's recent transatlantic flight and are to be used by members of the Byrd Antarctic expedition.

Current Crude Rubber Items

TRADING IS QUIETER ON RUBBER EXCHANGE

Dullness Pervades Market with Lower Prices Prevailing as Dealing Is Chiefly Confined to Speculative Liquidation of September Rubber.

DURING the past fortnight price quotations on the New York Rubber Exchange have declined from 10 to 50 points in all the active trading months. Only on one day of the 11 trading days has the spot price of rubber risen as high as 19 cents and in the closing quotations it had dropped to 18.60.

Trading on the exchange continues quiet with more activity toward the end of the period than during the first week. Most of the business transacted has been in the form of switches, considerable liquidation in the September position being in evidence.

The record total of 10,671 tons of rubber invoiced to the United States during the week ending August 25 was responsible in great measure for the price decline, offsetting the recent drops in visible stocks in this country. It is generally expected that August consumption will show an excess of approximately 10,000 tons over August imports and this may tend to make the market firmer.

The expected accumulations in the Malayan States by the end of October still have their effect on New York trading. A census of Malayan stocks taken at the end of July shows that the rubber held on estates has increased from 44,791 tons to 53,666 tons, although rubber in the hands of dealers has dropped from 13,536 tons to 9,055. What the total will be by November 1 is variously estimated from 75,000 to 100,000 tons, but approximately 35,000 tons of this must be considered as normal working stocks.

The fact that all indications point to the consumption of well over 400,000 tons of crude rubber in the United States during 1928, however, is certain to have a steadying effect on the market, and, even though the price of rubber may drop further in the next few weeks, it should be a question of only a month or two when substantially higher levels will be current.

The table below indicates the daily fluctuations in prices on the Exchange and the daily volume of sales.

BALATA EXPORTS ARE MYSTERY TO ECUADOR

No official export records are available at Guayaquil to account for the 55,000 pounds of balata rubber imported into the United States from Ecuador in 1927, according to Vice Consul W. Allen Rhode. Local rubber exporting houses emphatically declare that balata is neither produced by nor exported from Ecuador.

It is reported that a trader located at Juan Jiris or Montalvo on the upper Bobonaza River floats an armed raft down to the Amazon every year or two, and it is probable that the 55,000 pounds of balata in question was exported from Ecuador in this manner. Such a shipment originating in Ecuadorian Oriente, the wild and inaccessible easternmost portion of the country, would show Ecuador as its country of origin though the transaction might be unknown to the merchants and government.

The resident manager of the Djastinga Rubber and Produce Company, Ltd., West Java, has been devoting considerable time and attention to bud grafting. He has some of the heaviest yielding trees in Java and expects to obtain about 880 pounds of dry rubber per acre.

DUTCH PLANTER FIGURES TOTAL RUBBER ACREAGE

M. R. Hamaker, director of the Belgisch-Javasche Cultuur Miji, has compiled figures to show that the prevailing price of rubber can not give the planter a profit. He estimates that there are 4,200,000 planted acres of rubber, of which 3,000,000 produce about 310 pounds an acre or 420,000 tons. About 2,000,000 acres of this rubber, he says, was planted before 1913 and the remainder before 1922. Some of this acreage is deteriorating, he claims, and on none of it can rubber be produced at less than 21 cents a pound cost.

GRAVES MADE COUNSEL TO RUBBER INSTITUTE

Announcement was made on August 20 by General Lincoln C. Andrews, director-general of the Rubber Institute, Inc., of the appointment of Harmon S. Graves as general legal counsel to the Institute.

Mr. Graves is a member of the firm of Graves & Yawger, Chase National Bank Building, 20 Pine street, New York City.

New Exchange Members

The Board of Governors of the Rubber Exchange of New York, Inc., on August 28 approved the admission of four new members. These were A. B. C. Dudok deWit, of Handelsvereeniging van Dudok & Co., Amsterdam, Holland; Everett W. Laird, of Earle & Earle; Eugene J. Schwabach, of E. J. Schwabach Co.; and Henry M. Rose, c/o H. Muehlstein & Co., Inc.

The *Ceylon Green Book* for 1928 has just been published with complete information about that island. Special sections deal with general information, legal information, official and professional mercantile data, classified occupations, institutes, clubs, estates and companies, and sports. It is issued by the Times of Ceylon, Blackfriars House, London.

Closing Prices on Rubber Exchange of New York, Inc.

FROM AUGUST 21 TO SEPTEMBER 4, 1928

	Date	Spot	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sales*
Aug.	21	18.80	18.80	18.90	18.90	18.90	18.70	18.70	18.80	18.80	18.80	18.80	18.80	——	406
	22	18.80	18.70	18.80	18.80	18.80	18.70	18.70	18.70	18.80	18.90	18.90	18.90	——	339
	23	19.00	19.00	19.10	19.10	19.10	19.00	19.00	19.00	19.10	19.20	19.20	19.20	——	338
	24	18.90	18.70	18.90	18.90	18.80	18.80	18.80	18.80	18.90	18.90	18.90	18.90	——	367
	25	18.70	18.60	18.70	18.70	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.90	——	23
	27	18.60	18.50	18.70	18.70	18.80	18.80	18.80	18.80	18.90	19.00	19.00	19.00	——	416
	28	18.60	18.50	18.70	18.70	18.70	18.70	18.80	18.80	18.80	18.80	18.80	18.80	——	600
	29	18.60	18.60	18.70	18.70	18.80	18.70	18.80	18.80	18.80	19.00	19.00	19.00	——	338
	30	18.70	18.60	18.80	18.80	18.80	18.70	18.80	18.80	18.90	19.00	19.00	19.00	——	107
	31	18.70	18.50	18.70	18.70	18.70	18.70	18.70	18.70	18.80	19.00	19.00	19.00	——	206
Sept.	4	18.60	18.50	18.80	18.80	18.80	18.70	18.70	18.80	18.90	18.90	18.90	18.90	——	196

*In lots of 2½ tons each

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PATENTS AWARDED TO FIVE AKRON INVENTORS

Five Akron inventors were awarded patents on various devices designed for the rubber industry on August 30. The majority of them were assigned by the inventors to leading rubber companies.

James W. Brundage was granted a patent on a new tire vulcanizer and Robert M. Pierson on a tank valve, both of which were assigned to the B. F. Goodrich Company. Daniel E. Hennessy secured two patents for a method of making rubber tubes, both being assigned to the Fisk Rubber Company. Two patents were given William P. Horst for a vulcanized rubber product and a method of production, each of which was assigned to the Rubber Service Laboratories. A repair part for footwear was patented by William A. Owen.

FLOWER SHOW IS HELD AT FIRESTONE FACTORY

The annual flower show of the Firestone Tire & Rubber Company was held on August 25 at the factory with hundreds of the firm's employes entering flowers in the exhibit. A silver loving cup offered by Mrs. Harvey S. Firestone was awarded as the grand prize for the most beautiful vase of 36 blooms, judged for arrangement and quality.

Cash prizes amounting to $170 were also presented during the course of the affair which lasted from noon to 10 o'clock in the evening. All flowers not removed at the close of the exhibition were donated to the Children's Hospital of Akron.

Akron Reclaiming Co. Outing

More than 500 persons were present on August 20 at the picnic held for the employes of the Akron Rubber Reclaiming Company, Barberton, O., at Summit Beach Park. Athletic contests and other varied forms of entertainment filled the program of the day.

INDIA MACHINE CHARGES INFRINGEMENT OF PATENT

Asking a permanent injunction and suitable damages, the India Machine & Rubber Mold Company on August 22 filed suit against the Bridgwater Machine Company on charges of infringement of patent rights. Royalties for every alleged patent infringement are also asked in the suit which was filed in the Federal Court at Cleveland.

The patent rights in dispute, according to the petition, are those of Frank L. Johnson. Johnson is said to be the inventor of improvements in the manufacture of collapsible tire cores.

GOODYEAR EMPLOYES TO GET AVIATION LESSONS

The first flights in a free balloon for a group of student pilot employes of the Goodyear Tire & Rubber Company were made August 22 from the Wingfoot Lake Field. This marks the inception of a course of training in aeronautics for workers in the employ of the company.

Jack Boettner acted as pilot of the first flight and carried with him Verne Smith, August O'Neil, Carl Fickes, Kenneth Reynolds and Professor W. G. Henderson of Goodyear University.

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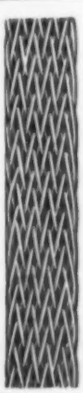

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GENERAL MACHINE WORK

Akron, Ohio

SEIBERLING DOUBLES RECORD OF LAST YEAR

That August sales of the Seiberling Rubber Company would exceed the record of $2,040,000 established in July was predicted in mid-August by officials of the organization. A tire production of 7,000 a day was just double the output for the same time last year.

Prospects are such that 1928 will probably set a new record for the company, the volume for the first eight months being approximately 40 per cent greater than for the corresponding period in 1927. Speed in handling shipments will be increased by the company's new warehouse which provides space for 75,000 tires. Eight cars can be loaded at one time in the new warehouse which is 250 feet long, 100 feet wide and three stories in height.

F. A. Seiberling, president of the organization, has already estimated that production in 1929 will be double that of the present year.

PATENT INFRINGEMENT CHARGED TO FIRESTONE

Alleging infringement of patent rights, the Concealed Door Check Company, of Kokomo, Ind., on August 30 filed suit in Cleveland against the Firestone Tire & Rubber Company. The Kokomo concern charges that the Firestone organization is manufacturing and selling a doorcheck strap in violation of patent rights which it holds.

A permanent injunction, an accounting of profits, and three times the amount of profits as damages are asked in the petition.

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, SEPTEMBER 6, 1928

COTTON

HIGHER cotton prices prevailed toward the end of August and the early days of September due to unfavorable weather conditions in the principal growing states. Too heavy rains in the eastern section and not enough in the state of Texas stimulated advances amounting to several dollars a bale. Weather reports generally brought greater reactions than private information to the effect that the crop is deteriorating owing to insect damage and excessive shedding.

The trade bought rather heavily at the low prices early in the period, but have shown less interest as the market rallied. Sentiment in domestic cotton textile centers, however, is somewhat more confident. There is a general tendency to await the results of the next Department of Agriculture estimate of the crop as of September 1, which has been delayed. Ten private estimates give an average crop of 14,515,000 bales as compared with 14,808,000 bales by the same authorities a month previous.

High, low and closing quotations as of September 5 were as follows:

	High	Low	Close	Close
		Sept. 5		Aug. 20
October	19.05	18.86	18.98	18.62
December	18.92	18.70	18.82	——
January	18.85	18.63	18.75	——

Tire Fabrics

That tire manufacturers intend to maintain their heavy production is indicated by the heavy buying that has taken place in the tire fabric market. Prices have shown an upward trend due to this increase in interest, and a steady market during the fall season is generally expected in all quarters. Late prices follow:

CORD				
Peeler, carded, 23/5/3	lb.	.46	@	.48
Peeler, carded, 23/4/3	lb.	.46	@	.47½
Peeler, carded, 18/3/3	lb.	.43	@	.44½
Peeler, carded, 15/3/3	lb.	.44	@	.45½
Egyptian, carded, 23/5/3	lb	.57	@	.58
Egyptian, combed, 23/5/3	lb.	.63	@	.64
CHAFERS				
Carded, American, 8 oz.	lb.	.40	@	.41
Carded, American, 10 oz.	lb.	.40	@	.41
Carded, American, 12 oz.	lb.	.41	@	.43
Carded American, 14 oz.	lb.	.39	@	.43
LENO BREAKER				
Carded American, 8¼ oz.	lb.	.39	@	.43
Carded American, 10¼ oz.	lb.	.39	@	.43
SQUARE WOVEN				
Carded American, 17¼ oz. 23-11 ply	lb.	.45	@	.46
Carded American, 17¼ oz. 10-5 ply	lb.	.39	@	.40

Sheetings

The market for the past half month has been extremely quiet with prices practically unchanged. The lower quotations due to reflection of the drop in cotton prices failed to stimulate activity in buying.

40-inch, 2.50-yard	yd.	.12⅝	@	.12½
40-inch, 2.85-yard	yd.		@	.11
40-inch, 3.15-yard	yd.	.12	@	.12¼
40-inch, 3.60 yard	yd.		@	.09⅜
40-inch, 3.75-yard	yd.		@	.08⅞
40-inch, 4.25-yard	yd.	.07¾	@	.07⅞

Ducks

The market in ducks has been quiet with prices unchanged except for a slight decline in single fillings. More factory buying is looked forward to, however, and gives promise of an opportunity to clear out in full such inventories as may have accumulated during the past few months. Late quotations follow:

Belting and Hose	lb.	.33½	@	.35½
Enameling	lb.	.36	@	.41
Single filling	lb.	.14¼	@	.16
Double filling	lb.	.17	@	.18

RECLAIMED RUBBER

The rate of consumption of reclaimed rubber has continued steady, manufacturers still using as large quantities as during the first six months of 1928. With only slight changes in prices on certain of the minor grades, the market remains firm and reclaimers look forward to favorable conditions during the fall and winter months. Most reclaiming plants have been operating close to capacity this year and with the present healthy outlook for the industry should continue to do so. Late prices were as follows:

High Tensile				
Super-Reclaim No. 1 Black	lb.	.12½	@	.13
Super-Reclaim No. 2 Black	lb.	.11½	@	.11¾
High Tensile Red	lb.	.13½	@	.13¾
Shoe				
Unwashed	lb.	.07¼	@	.07½
Washed	lb.	.10	@	.10¼
Tube				
No. 1 (Floating)	lb.	.14½	@	.15
No. 2 (Compounded)	lb.	.11	@	.11½
Tires				
Black, washed		.09½	@	.10
Black, unwashed		.07¾	@	.08
Black selected tires	lb.	.08	@	.08¼
Dark Gray	lb.	.09½	@	.09¾
Light Gray	lb.	.12	@	.12½
White	lb.	.13	@	.13½
Truck, Heavy Gravity	lb.	.07	@	.07¼
Truck, Light Gravity	lb.	.07¾	@	.08
Miscellaneous				
Mechanical Blends	lb.	.06¾	@	.07½
Red	lb.	.13½	@	.13¾

Scrap Rubber

The market for scrap rubber within the last two weeks has shown little change either in demand or in price. The market, while not strongly active, is firm and prices continue to remain steadily at high levels. Mixed tires are especially steady and the domestic call for tube scrap is reported as recently improved. Late prices follow:

(Prices to Consumer)

Auto tire peelings	ton	37.00	@	38.00
Standard White auto	ton	55.00	@	57.50
Mixed auto	ton	25.00	@	26.00
Bicycle tires	ton	25.00	@	27.50
Clean solid truck tires	ton	22.00	@	24.00
Boots and shoes	lb.	.01⅜	@	.01½
Arctics, trimmed	lb.	.00⅞	@	01
Arctics, untrimmed	lb.	.00⅜	@	.00⅞
Inner tubes, No. 1	lb.	.06¾	@	.07
Inner tubes, No. 2, compounded		.04½	@	.04¾
Inner Tubes, Red	lb.	.05½	@	.05¾
Air Brake Hose	ton	35.00	@	37.50
Rubber Hose	ton	18.00	@	20.00

CRUDE RUBBER

THE crude rubber market has shown a downward trend due to heavy shipments to the United States and apprehension over the Malayan accumulations. These factors, together with a lack of interest on the part of buyers, has brought the price of ribbed smoked sheets down to 18¼ cents with a possibility of its dropping still further.

The ambers and crepes have generally showed more resistance although no longer topping the standard smoked ribs in the quotations. According to reports, two of the larger manufacturers have been in the market for Amber Crepe, No. 2, and have bought heavily for October shipment.

Complete figures on American imports and consumption are expected to show crude rubber stocks in the United States as of August 31 barely reaching a sufficient supply for two months at the present rate of factory absorption. London stocks are less than half what they were a year ago and far lower than at any time since August, 1926.

An unusual dullness has evinced itself on all sides in the rubber market and it is believed that all interests are adopting the policy of going slowly until further developments with relation to the accumulating stocks in the Far East become apparent. While it is generally believed that no further restrictive efforts will be made, the American Rubber Pool still remains in force to await such a possibility.

Prices on the New York outside market on September 5 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Sept.	.18⅝	@	.18¾
Oct.-Dec.	.18½	@	.18⅝
Jan.-Mar.	.18½	@	.18⅝
First Latex, crepe spot	.19¼	@	.19⅜
Amber Crepe, No. 2	.18⅝	@	.18⅞
Amber Crepe, No. 3	.18½	@	.18⅝
Amber Crepe, No. 4	.18⅛	@	.18⅜
Brown Crepe, Rolled	.18	@	.18⅛
Brown Crepe, Clean, thin	.18¼	@	.18½
Brown Crepe, specky	.17¾	@	.18
Liquid Latex, per gal.		@	1.50
Paras—			
Up-river Fine	.19¾	@	20¼
Up-river Medium	Nominal		
Up-river Coarse	.13	@	.13¼
Acre Bolivian, fine	.20¼	@	.21
Caucho Ball, Upper		@	.11¾
Islands, fine	Nominal		
Centrals—			
Central, scrap	.15	@	.15½
Esmeraldas	.14¾	@	.15
Balata—			
Block, Colombia	Nominal		
Block, Cuidad	.37	@	.38

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Sept.	8¾	@	8⅞d
Oct.-Dec.	8⅞	@	9d
Jan.-Mar.	9	@	9⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	8⅝	@	8¾d

Charles T. Wilson Co., Inc.
44 Beaver Street — New York

Importers of

CRUDE RUBBER

Members Rubber Exchange of New York, Inc.
Members Rubber Exchange Clearing House, Inc.

AKRON OFFICE: 507 Second National Building
Telephone Main 3799

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Smoothness of the surface of a rubber product is noticeable where Factice is used

The STAMFORD RUBBER SUPPLY COMPANY
STAMFORD, CONN.

RUBBER
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"TIRE" BRAND SUPERFINE 99½%

STAUFFER QUALITY CHEMICALS

"TUBE" BRAND VELVET 100%

"ANCHOR TO STAUFFER"

STAUFFER CHEMICAL CO. of TEXAS
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Sales Offices: 111 W. Washington St. Chicago; 1531 W. 25th St. Cleveland; 452 Lexington Ave. New York

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CONGAREE CLAY

Air Floated ~ Pure White

UNITED CLAY MINES CORP.
TRENTON, N. J.
High Grade CLAYS of All Kinds

The CARTER BELL MFG CO

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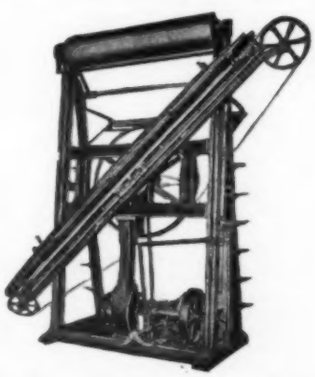

The Bolton Vertical Bias Cutter

WE HAVE PERFECTED many improved devices for our Bias Cutter which simplify its operation, increase its efficiency and promote greater economy in operation.

Cuts cord or flat woven fabrics with equal ease and precision. Cutting range from 1-4 inch strips to 60 inch. Bias blocks on any angle from the horizontal to 45 degrees.

SPADONE MACHINE CO., INC.
15 PARK ROW — NEW YORK, N. Y.
Foreign Representatives: Francis Shaw & Co., Ltd., Bradford, Manchester, Eng.

LATE RUBBER CHEMICAL PRICES

Accelerators—Colors—Softeners—Compounding Materials

NEW YORK, SEPTEMBER 6, 1928

WITH prices unchanged during the past fortnight, the market for rubber chemicals and compounding materials has continued firm and steady. Manufacturers, finding the demand heavy due to the present capacity production rate at practically all rubber factories, have been continuing their own high production schedules.

So long as tire and other rubber manufacturers maintain their high rate of absorption it is expected that the suppliers of chemicals will rush their output and at the same time be able to hold steadily to the present price scale in all types of compounding and other materials. The entire situation remains most favorable for makers of chemical ingredients and should continue so for the fall season.

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.75 @	—
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¼
Cryiene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyiguanidine	lb.	.48 @	.50½
Diphenyiguanidine	lb.	.40 @	.42½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline, 140° m. p.	lb.	.33 @	.35½
Formaldehyde Aniline, 60° m. p.	lb.	.31 @	.33½
Grasselerator 102	lb.	.58½@	.61
Grasselerator 552	lb.	— @	4.45
Grasselerator 808	lb.	.79 @	.85
Grasselerator 833	lb.	1.17 @	1.30
Heptene	lb.	.45 @	.55
Hexamethylene-tetramine	lb.	.57½@	.60
Lithex	lb.	.18 @	.20
Methylenedianilide	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Tensilac, No. 39	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermlo F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.25½@	.26½
Thionex	lb.	3.25 @	—
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.65 @	.70
Vulcanex	lb.	.68 @	—
Vulcone	lb.	.68 @	—
Vulcanol	lb.	1.03 @	1.08
Waxene	lb.	.30 @	.32
Z 88	lb.	.65 @	.69
Inorganic			
Lead, sublimed blue	lb.	.08¼@	.08¾
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09½@	.12
Magnesia, calcined,			
light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.33 @	.35
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05 @	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.29 @	.32
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.34 @	.36
Reds			
Antimony			
crimson, 15/17	lb.	.44 @	.50
sulphur free	lb.	.50 @	.55
golden 15/17 F.S.	lb.	.18 @	.22
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.85 @	1.95
Whites			
Lithophone, Akcolith	lb.	.05 3/5@	.06
Lithophone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.10 @	.10½
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.07⅛
Zinc Oxide—French Process			
White seal	lb.	.11⅞@	—
Green seal	lb.	.10⅞@	—
Red Seal		.09⅞@	—
Yellows			
Chrome	lb.	.15½@	.16½
Ocher, French medium	lb.	.03½@	.06
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.08½@	.12½
Bone Black	lb.	.05½@	.11
Carbon, compressed	lb.	.08 @	.12
Carbon, uncompressed	lb.	.07½@	.11½
Drop Black	lb.	.06 @	.10
Fumonex	lb.	.06 @	.09
Gastex	lb.	.05¼@	.05½
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.08½@	.12½
Velvetex carbon	lb.	.04½@	.06
Blanc fixe dry f.o.b. works	lb.	.03½@	.03⅝
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	10.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Velvetex	lb.	.04 @	.07
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.18½@	.19½

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulphuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.35 @	.36
Acids, Fatty			
Stearex	lb.	.11 @	.15
Stearic, double pressed	lb.	.11½@	.12½
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¼@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	—
Para-Flux	gal.	.17 @	—
Peanut, domestic, crude	lb.	.12 @	.12½
Petrolatum, white	lb.	.08 @	.08½
dark amber	lb.	.03⅝@	.03⅝
Pine, steam distilled	lb.	.70 @	
Rapeseed, refined	gal.	1.04 @	1.06
second rectified	gal.	.58 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb.	bbl.	8.55 @	—
Pigmentar	gal.	.33 @	.41
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured, No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline, steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	@	.50
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Miscellaneous			
RSL Mold Solution	gal.	.75 @	.100

ANTI-OXIDANTS

Antox	lb.	.79 @	.83
Neozone	lb.	.74 @	—
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.65 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.08¼@	.08½
Sulphur flour,			
Superfine bags	cwt.	2.20 @	2.30
Superfine, bbls.	cwt.	2.55 @	3.10
100% pure, refined, bags	cwt.	2.60 @	3.15
bbls.	cwt.	2.95 @	3.50

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THE feature of the past fortnight in rubber statistics was the record amount of crude rubber invoiced to the United States during the week ending August 25. In that period 10,671 long tons were invoiced for shipment to this country, the largest total to be recorded for well over a year. Following a high quantity of 9,949 tons during the week previous, this helped to cause a downward trend in the New York market.

The amount of rubber imported during August, however, is still expected to be nearly 10,000 tons below the consumption in the course of the month. This will cause a further reduction in the total stocks of crude rubber in this country, which totaled only 83,242 tons at the end of July.

London stocks continue to be lower than at any time in the past two years, a slight increase at the end of August being wiped out by light receipts and heavy deliveries in the following week. The announcement of a census of Malayan stocks at the end of July showed a gain of only 4,394 tons. At this rate of accumulation the Malayan total stocks at the end of October should be under 75,000 tons instead of the 100,000 or more estimated in some quarters.

Tire manufacturers are still working close to capacity, and production is steady in footwear and other lines. Ford has announced his intention of building a $10,000,000 plant at Los Angeles, and car manufacturers at Detroit are employing 80,000 more men than last year to rush production, assuring a demand for automotive rubber products.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1926:							
Jan.	42,404	72,528,151	76.36	2,059	3,747,505	81.24	40,345
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	48,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,080	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,871,217	55.41	23,795
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,108	30,278,444	34.56	1,988	1,734,990	38.95	37,120
Feb.	33,664	27,763,655	36.82	2,738	2,229,589	36.35	30,926
Mar.	40,688	32,109,376	35.23	3,718	2,587,434	31.07	36,950
Apr.	37,958	27,296,346	32.23	2,272	1,415,024	27.80	35,686
May	31,058	19,058,672	27.80	2,399	1,386,307	25.80	28,659
June	27,764	14,121,219	22.71	2,621	1,400,697	23.86	25,143
July	27,129	11,581,969	19.06	3,087	1,451,446	20.99	24,042
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	5,045	16,938	30,106	29,058	29,638	32,196	31,518	34,403
Feb.	5,955	14,767	30,149	25,736	29,761	31,136	30,137	33,702
Mar.	9,190	21,408	36,629	28,385	33,498	32,936	36,141	35,689
Apr.	13,084	19,294	29,085	27,129	34,139	32,696	35,871	32,772
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592	37,333
June	16,142	31,713	24,272	22,753	35,822	28,598	33,801	37,676
July	18,310	24,522	17,685	23,396	36,053	27,577	29,219	37,497
Aug.	23,649	29,361	20,359	28,982	35,909	34,533	33,460	
Sept.	16,705	24,410	17,594	31,497	31,691	32,904	27,214	
Oct.	16,814	26,881	21,321	31,520	29,047	29,836	26,790	
Nov.	14,105	24,950	20,437	27,289	28,853	28,080	26,792	
Dec.	15,482	25,070	21,902	27,199	28,748	26,293	25,492	
Totals	170,504	282,560	305,694	328,769	388,481	366,149	371,027	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	207,058

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
June 30	4,797	1,094	1,670	821	8,382
July 7	5,231	899	1,601	842	8,573
July 14	4,403	859	2,249	277	7,788
July 21	4,879	384	1,648	320	7,231
July 28	4,685	1,065	2,083	178	8,011
Aug. 4	4,271	692	1,335	1,582	7,880
Aug. 11	4,916	740	2,373	916	8,945
Aug. 18	6,416	776	1,813	944	9,949
Aug. 25	6,932	946	2,340	453	10,671
Sept. 1	5,501	979	1,238	835	8,553

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
December	106⅝	106½	107⅜	107¼	108¼	—	108	109	109¼	106	105½	105½	—	101	99⅛	90¼	93	88⅛	86⅝	—	88¼	90¼	88¾	88¾	88¾	—	—	91	93	91¼	91¼	98½
1926																																
January	—	—	—	87	87¼	85½	86½	87½	87¾	—	85½	85½	85¼	85½	84⅝	82½	—	75⅝	75½	75½	76	72	72½	—	68	66½	67	69¼	70½	69	—	79½
February	67	67½	66¼	66¾	66	69	—	—	67	65	66	66	65½	63	65½	60½	60½	60	59	60	—	—	56	55	62	61¼	51	—	—	—	—	62¾
March	56	58	58	58½	58¼	57½	—	—	56	61	60	63	61½	62	62	60½	61	60	61	61	61½	61	61	60	60	59½	59½	—	59½	58	58	59
April	59	59	59	58	59	58	56½	56½	56½	53	53	51½	50½	48½	49¾	47½	48½	47½	48½	48½	48	48	49	48	48	48	48	48	48½	—	—	51¼
May	48½	50	50	50¼	49¼	49¾	49¾	49¾	49	49¾	49	49	48½	47¾	47½	47½	47½	47½	47½	47½	47¾	46¾	46	46	45	45	45	43	42	—	—	47¾
June	41½	42	41¾	42	41½	41½	41½	41½	42	42	42	42	43½	42	43½	43½	43	43	43	43	44	44	43	43½	43	43	42	42	42	—	—	42½
July	42	42	42	42	41½	41½	41½	41½	41½	41½	41	41	41	40	42	43	43	43	43	43	43	41	41½	41½	41½	41½	41½	41½	41½	41½	41½	42½
August	—	42	42	42	41½	41½	41½	41½	41½	41½	41	41	41	40	42	43	43	43	43	43	43	41	41½	41½	41½	41½	41½	41½	41½	41½	41½	42½
September	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	38	38	39	39	41	41½	42	42½	42½	39	39	40	39¾	39	41¼
October	43	43	43	43	43	43	43	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	41¾	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½
November	41¼	41¼	41	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛	42⅛
December	36⅞	37½	37½	37⅝	—	37	—	37	37	37	37½	37½	37⅝	37⅝	37⅝	38	38	38¼	38½	38	38½	38	38½	38½	38½	38	38	37	37	38½	38½	38¼
1927																																
January	—	—	37¾	—	39¼	39	39¾	40⅛	—	40⅛	40¾	40¾	40⅝	39¾	39¾	—	39¾	38¼	38½	38½	38¾	38¾	38¾	38¾	38¾	38¾	38½	38½	38	38	38	38	38¾
February	—	—	37¾	—	37¼	—	—	37⅞	—	37⅞	37¾	—	—	38	38⅝	—	38	38⅝	—	—	38⅝	38⅝	38½	38¾	39	39	39	39	39	—	—	38¾
March	39¾	39¾	40	40¼	41	41	40¾	41	40¾	40¾	41¼	41	41¼	41¼	41¾	41¾	41¾	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41¼	41	41	41	41¼	41½	41
April	41¼	41¼	41	41	41	41¼	41¼	41¼	41¼	41¾	41¼	41	40⅝	40¾	40¾	40¾	40¾	40¾	40¾	40½	40¾	40¾	40¾	40¾	40½	40½	40½	40½	40½	40½	40½	40½
May	—	—	40¾	40½	40¼	—	—	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	41	41	40¾	40¾	40¾	40¾	40¾	40¾
June	40¾	40¾	40¾	40¼	40¼	39¾	39¾	39¾	38¾	37¾	37¾	37¾	37¾	37	35	34½	35	35½	35½	35½	35½	35½	35½	35½	36¾	36¾	36¾	36¾	35¾	35¾	35¾	36¾
July	35½	—	—	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	34½	34½	34½	34½	34½	34½	34½	34½	34½	34½	34½	35¼	35¼	35¼	35¼	34¾	35	35	35
August	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼	35¼
Sept.	34	33¾	—	—	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	33¾	34	33¾
Oct.	35	35¼	35¼	35¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	35¼	34¾
Nov.	40½	40¼	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40½	40	40	37½
Dec.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1928																																
January	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
February	37¾	37¾	37¾	37¾	37¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
March	28¾	28¾	28¾	27½	27½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
April	27¼	27¼	27½	21½	21¼	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May	17¾	18¾	19¼	19¼	19¼	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
June	19¾	—	19¾	19¾	19¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
July	—	18¾	18¾	—	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
August	19½	19½	19¾	19¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59
July	14.67	26.10	22.16	103.16	41.03	23.44	19.40
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Sixth Restriction Year—Third Quarter

Day	Aug.	Sept.	Oct.	Day	Aug.	Sept.	Oct.
1	9⅝	—	—	17	9½	—	—
2	9⅝	—	—	18	9½	—	—
3	9½	9	—	19	—	—	—
4	—	8⅞	—	20	9⅜	—	—
5	—	—	—	21	9¼	—	—
6	—	—	—	22	9¼	—	—
7	9½	—	—	23	9¼	—	—
8	9½	—	—	24	9¼	—	—
9	9½	—	—	25	9⅛	—	—
10	9½	—	—	26	—	—	—
11	9½	—	—	27	9	—	—
12	—	—	—	28	9	—	—
13	9½	—	—	29	9	—	—
14	9½	—	—	30	9	—	—
15	9⅝	—	—	31	9	—	—
16	9½	—	—				

The average price for the period for which the daily prices are reported above is approximately 9.296 pence. All restrictions on rubber exports from British Malaya and Ceylon will officially cease on October 31.

Average Price in Previous Quarters

Quarter	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28
Nov.-Jan.	14.285	14.175	17.9983	46.709	19.265	19.023
Feb.-Apr.	16.858	12.917	19.356	28.103	19.696	12.591
May-July	14.242	10.947	38.469	21.001	18.165	9.154
Aug.-Oct.	14.944	14.632	43.269	20.199	16.620	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.
1	19.90	——	11	18.90	——	21	19.15	——
2	19.70	——	12	——	——	22	19.20	——
3	19.85	——	13	18.55	——	23	19.00	——
4	19.95	19.05	14	18.95	——	24	19.10	——
5	——	——	15	19.20	——	25	19.10	——
6	19.65	——	16	19.35	——	26	——	——
7	19.65	——	17	19.10	——	27	19.00	——
8	20.40	——	18	19.10	——	28	19.30	——
9	18.95	——	19	——	——	29	19.15	——
10	19.30	——	20	18.85	——	30	19.10	——
						31	19.05	——

Average Monthly Price Per Pound

Month	1926 Cents	1927 Cents	1928 Cents	Month	1926 Cents	1927 Cents	1928 Cents
Jan.	20.85	13.42	19.12	Aug.	18.57	20.04	19.28
Feb.	20.60	14.10	18.40	Sept.	17.02	21.95	
Mar.	19.35	14.32	19.38	Oct.	13.14	20.55	
Apr.	19.13	14.75	20.63	Nov.	12.86	20.22	
May	18.92	16.07	21.58	Dec.	12.68	19.58	
June	18.57	16.85	21.50	Average for Year	17.53	17.49	
July	18.71	18.00	21.36				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	55,198	76,172	110,244	46,296	45,312	41,256	100,434	121,484	151,500
Feb.	58,035	91,186	108,955	46,935	42,166	43,316	104,970	133,352	152,271
March	61,822	85,740	114,061	43,567	49,600	39,324	105,389	135,340	153,385
April	55,261	92,757	113,083	41,905	38,963	33,986	97,166	131,720	147,069
May	64,360	94,563	105,356	40,303	44,181	34,374	104,663	138,744	139,730
June	60,460	89,250	90,198	40,907	47,233	40,001	101,367	136,483	130,119
July	64,900	98,469	83,242	38,062	40,587	42,304	102,962	139,056	125,546
Aug.	60,870	96,148		37,360	40,937		98,230	137,085	
Sept.	62,078	97,829		42,464	37,966		105,542	135,793	
Oct.	64,089	97,452		52,930	42,804		117,919	140,256	
Nov.	69,385	101,034		47,311	37,076		116,696	138,110	
Dec.	72,520	100,130		52,020	47,938		124,540	148,068	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1920	1921	1922	1923	1924	1925	1926	1927	1928
Jan.	19,300	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524
Feb.	18,329	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964
Mar.	18,969	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272
Apr.	20,072	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425
May	20,921	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628
June	22,517	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727	63,717	
Aug.	30,674	73,211	72,112	58,427	49,700	4,619	30,165	64,491	
Sept.	35,504	72,175	70,977	54,523	44,011	5,453	35,077	68,236	
Oct.	41,743	69,229	68,536	58,891	37,523	5,086	42,138	69,569	
Nov.	45,550	70,786	68,548	60,074	33,593	3,869	44,057	67,050	
Dec.	50,652	69,792	72,299	60,246	29,488	5,697	48,918	63,793	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1927					
October	68,519	70,167	70,916	70,060	69,551
November	69,660	69,501	69,850	67,318	———
December	65,869	66,011	64,761	63,397	63,207
1928					
January	64,360	65,524	65,450	66,285	———
February	65,909	64,945	63,769	63,103	———
March	61,978	61,920	61,033	59,644	58,197
April	58,732	58,945	56,819	53,360	———
May	52,015	50,837	48,705	44,628	———
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,238	35,445	———
August	34,294	33,649	32,591	32,815	———
September	31,933				

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1926	1927	1928	End of	1926	1927	1928
Jan.	16,726	25,440	25,868	July	23,101	22,558	18,663
Feb.	13,653	26,766	22,867	Aug.	23,362	25,764	
Mar.	18,389	27,844	20,538	Sept.	25,997	25,178	
Apr.	16,328	24,543	16,946	Oct.	26,614	25,790	
May	16,967	25,133	17,437	Nov.	25,486	28,369	
June	19,416	21,898	18,207	Dec.	26,443	25,798	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1925	26,001,664	66.8
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1928			1928		
January	1,811,534	87.8	July	2,209,692	85.9
February	1,806,437	86.5	August	———	—
March	2,420,084	86.4	September	———	—
April	2,316,324	88.4	October	———	—
May	2,188,592	84.0	November	———	—
June	2,429,453	83.1	December	———	—

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1926	1927	1928
January	11,918,000	14,386,000	17,582,000	17,888,000	20,939,000
February	9,626,000	13,210,000	15,814,000	18,240,000	21,136,000
March	10,961,000	14,890,000	19,302,000	22,464,000	24,041,000
April	14,583,000	19,013,000	20,848,000	23,371,000	25,712,000
May	15,889,000	20,459,000	24,213,000	26,579,000	27,355,000
June	16,421,000	20,724,000	23,803,000	27,799,000	29,022,000
July	18,610,000	22,879,000	24,752,000	29,784,000	
August	19,825,000	22,323,000	26,912,000	29,779,000	
September	16,871,000	20,177,000	22,929,000	28,409,000	
October	18,029,000	19,826,000	23,973,000	25,497,000	
November	16,607,000	18,024,000	20,618,000	24,400,000	
December	15,663,000	17,954,000	21,419,000	23,718,000	
TOTAL	185,003,000	223,865,000	262,165,000	297,928,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	40,932	45,259	51,633	60,845	61,237	64,439
Shipments	39,987	45,204	50,120	59,262	59,002	64,059
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	4,587	4,965	5,491	2,974	4,932	5,394	9,947	10,432	9,949
Feb.	4,865	5,095	6,363	3,436	4,458	5,031	11,164	11,075	11,721
Mar.	5,456	6,276	6,819	4,561	5,701	5,731	12,004	11,583	12,389
Apr.	5,346	6,299	6,178	4,980	5,701	5,812	12,461	12,122	12,717
May	5,023	6,151	6,759	5,211	5,657	6,457	12,343	12,462	13,024
June	5,422	6,202	6,692	5,724	6,253	7,117	11,968	12,462	12,162
July	4,950	5,087		6,337	5,973		10,592	11,326	
Aug.	5,872	5,752		6,744	6,393		9,732	10,721	
Sept.	5,706	4,822		6,040	5,717		9,818	9,722	
Oct.	5,103	4,773		4,544	4,799		9,917	9,665	
Nov.	4,324	4,502		3,733	4,306		10,297	10,136	
Dec.	4,683	4,497		4,718	4,165		10,456	10,264	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927
Production	50,850	60,116	70,706	82,614	76,618	70,823
Shipments	49,673	59,072	68,016	81,004	71,591	72,896
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
Jan.	6,809	5,337	5,441	3,723	6,016	6,072	14,361	15,585	12,982
Feb.	6,825	5,658	6,895	3,736	5,120	5,431	17,090	16,075	14,659
Mar.	7,030	7,184	6,231	4,987	6,157	5,731	19,131	17,096	15,573
	6,554	7,373	6,661	5,051	6,359	5,702	20,674	17,801	16,638
May	6,149	6,737	7,168	6,304	6,140	6,300	21,141	18,389	17,702
June	6,171	6,306	6,953	6,898	6,832	7,136	20,243	17,858	17,159
July	5,729	5,284		8,569	7,070		17,267	16,004	
Aug.	7,424	6,480		9,579	7,983		15,462	14,664	
Sept.	7,590	5,651		7,762	6,758		15,312	13,511	
Oct.	6,208	5,065		5,474	5,024		15,929	13,539	
Nov.	4,852	4,775		4,045	4,723		16,604	13,585	
Dec.	5,277	4,969		5,463	4,712		16,200	13,692	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1921	1,595,304	1,452,902	142,402	66,246	61,098	5,148	1,661,550
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
Jan.	238,926	199,650	39,276	15,376	11,745	3,631	254,302
Feb.	304,758	264,171	40,587	18,655	14,826	3,829	323,413
March	394,430	345,911	48,519	23,250	19,723	3,527	417,680
April	404,743	357,009	47,734	24,611	20,890	3,721	429,354
May	404,099	357,148	46,951	25,708	21,991	3,717	429,807
June	321,959	278,728	43,231	19,208	16,470	2,738	341,167
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	282,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512				
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[2]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[3]	India & Burma[4]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[5]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1926:															
Apr.	23,727	10,565	13,162	3,766	590	679	374	293	4,226	4,598	6,285	410	2,318	1,529	38,230
May	31,231	10,604	20,627	3,944	691	927	410	279	4,440	5,358	8,737	502	1,353	1,464	48,782
June	30,624	11,764	18,860	4,208	452	779	512	275	4,444	6,125	10,614	549	1,213	1,279	49,310
July	28,824	15,280	13,544	4,422	938	911	498	439	4,618	5,612	13,112	1,521	1,565	1,148	48,328
Aug.	34,625	13,595	21,030	5,666	521	890	476	316	4,132	5,699	10,390	378	1,888	1,097	52,483
Sept.	35,913	13,972	21,941	6,015	651	888	689	457	4,065	6,568	11,391	681	2,156	822	56,324
Oct.	39,367	15,203	24,164	5,672	634	805	473	385	4,058	6,998	11,491	661	1,904	1,023	58,268
Nov.	34,302	12,201	22,101	4,228	1,110	685	547	285	3,988	5,816	9,422	718	1,911	1,259	52,070
Dec.	36,811	14,716	22,095	6,498	1,176	895	617	338	5,054	7,117	12,786	790	3,821	714	61,901
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	585	304	4,187	6,706	10,690	941	3,482	981	56,404
Feb.	27,528	11,697	15,831	3,571	1,469	552	445	360	4,078	6,526	10,535	675	2,104	1,098	47,244
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,581	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,188	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,731	16,618	11,113	4,352	1,605	842	500*	525	4,851	7,988	11,360	720	2,273	1,025	47,154
Feb.	28,813	12,911	15,902	4,353	1,081	667	500*	536	4,052	6,757	8,635	723	1,612	1,276	46,094*
Mar.	27,813	10,508	17,305	3,460	775	645	500*	269	3,999	5,826	9,690	613	2,750	1,211	47,043*
Apr.	20,029	9,335	10,694	3,460	789	630	500*	258	3,993	5,040	5,538	518	1,014	1,323	33,757
May	26,403	10,350	16,053	3,125	654	842	500*	241	4,943	5,355	10,382	619	2,062	1,200*	45,976*
June	22,930	16,168	6,762	3,125	963	926	500*	451	5,419	5,863	13,623	902	1,399	1,200*	41,133*
July	30,405	13,383	17,022	4,798		905	500*	366				744	1,264		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[a]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (ac)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1926:															
April	33,416	8,275	4,121	1,781	1,615	1,868	865	402	505	71	93	335	130	193	53,670
May	28,705	6,773	2,519	1,848	1,239	1,010	705	200	468	186	241	225	60	192	44,371
June	23,795	5,894	2,196	1,655	1,188	1,465	1,070	983	636	269	215	303	123	103	39,895
July	34,266	6,768	2,352	2,202	1,552	1,447	800	132	702	295	480	292	121	115	51,524
August	26,081	7,327	2,457	2,110	1,883	1,284	796	655	1,275	303	594	336	90	151	45,847
September	35,675	8,843	1,774	2,029	1,355	1,922	819	472	1,241	283	429	317	91	138	55,388
October	26,110	8,082	3,376	2,423	1,365	2,396	645	585	1,004	301	2	360	100	121	49,370
November	37,673	9,247	2,719	3,007	1,548	3,380	832	568	916	194	-18	358	90	181	60,695
December	35,850	4,749	2,890	2,562	1,847	856	439	725	777	248	156	443	151	306	51,999
1927:															
January	41,815	10,192	3,284	2,481	1,936	1,227	672	803	929	296	192	316	139	100	64,382
February	25,886	7,692	3,263	3,103	2,620	1,902	601	907	460	502	152	336	146	210	47,780
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	887	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,492	636	4,224	2,055	2,672	627,789
1928:															
Jan.	37,120	1 921	1,764	2,485	2,290	1,361	760	995	802	589	52	261	335	376	51,111
Feb.	30,926	3,143	2,526	2,984	2,553	1,258	437	159	616	599	98	307	296	297	46,199
Mar.	36,970	3,179	1,902	3,521	2,989	1 707	763	1,468	918	816	95	351	497	398	55,574
April	35,686	—2,280	2,204	2,719	1,938	2,353	1,115	926	832	575	280	339	304	159	47,150
May	28,659	—5,323	3,210	2,944	2,180	2,306	1,095	744	655	746	209	485		213	
June	25,143	—3,031		2,968	2,632			710	348	743	133				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—German, United Kingdom, and United States exports to Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4 305 tons in 1926 and to 5.019 tons in 1927.

BOOK REVIEWS

AIRCRAFT YEARBOOK FOR 1928. Published by Aeronautical Chamber of Commerce of America, New York City. 551 pp.

Including as it does all accessible facts and figures of the industry, the Aircraft Yearbook is invaluable to those who are interested in aeronautics. Detailed accounts of specific phases of the industry are presented after an introductory review of the field as a whole. The tremendous increase in interest in civil aviation is recorded, together with careful resumes of the work done by the government in the air. A review of the aeronautical activities of foreign countries shows France still in the lead. Technical development is described with numerous illustrations and diagrams, and an appendix of miscellaneous records, statistics and other information rounds out the volume.

STANDARD METHODS OF TESTING RUBBER PRODUCTS. Published by the Roessler & Hasslacher Chemical Company, New York City. 1928.

This small pamphlet contains the general instructions covering the laboratory testing of rubber products as conducted and recommended in generally accepted practice. It is a reprint from the American Society for Testing Materials Standard, 1927, Part II.

1928 SUPPLEMENT TO THE BOOK OF A. S. T. M. STANDARDS. Published by the American Society for Testing Materials. 1928. 185 pp.

As the first supplement to the 1927 Book of A. S. T. M. Standards, this volume should be of interest to rubber manufacturers whose products come within the lengthy list on which specifications are given. It contains 31 tentative standards advanced to standard and 10 replacements of existing standards.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:								
Jan.	432	242,339	27	24,218	588	183,705	150	86,702
Feb.	489	281,295	38	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,833
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	233,414	—	—	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	378	113,295	81	27,344

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

	Production	Consumption	% to Crude	Stocks*		Production	Consumption	% to Crude	Stocks*
Year		Tons			Year		Tons		
1919	81,366	73,535	36.3	.....	1924	80,079	76,072	22.4	.....
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....					
1927:									
Jan.	16,526	12,374	39.3	25,903	July	15,488	13,842	47.4	26,599
Feb.	15,860	14,424	47.8	27,291	Aug.	15,109	15,836	47.3	25,157
Mar.	16,788	13,528	37.4	27,124	Sept.	14,392	14,790	54.3	23,429
Apr.	14,483	16,677	46.5	25,712	Oct.	16,127	17,292	64.5	22,176
May	16,159	15,754	46.1	26,419	Nov.	15,477	14,876	55.5	21,728
June	16,652	15,547	46.0	25,811	Dec.	16,083	13,431	52.7	24,980
1928:									
Jan.	14,862	18,134	52.7	21,941	July	17,278	17,173	45.9	17,305
Feb.	15,291	16,808	49.9	20,848	Aug.				
Mar.	17,069	18,619	52.2	19,558	Sept.				
Apr.	15,393	17,355	52.9	19,283	Oct.				
May	18,945	18,201	48.8	18,137	Nov.				
June	18,781	16,328	43.4	18,709	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

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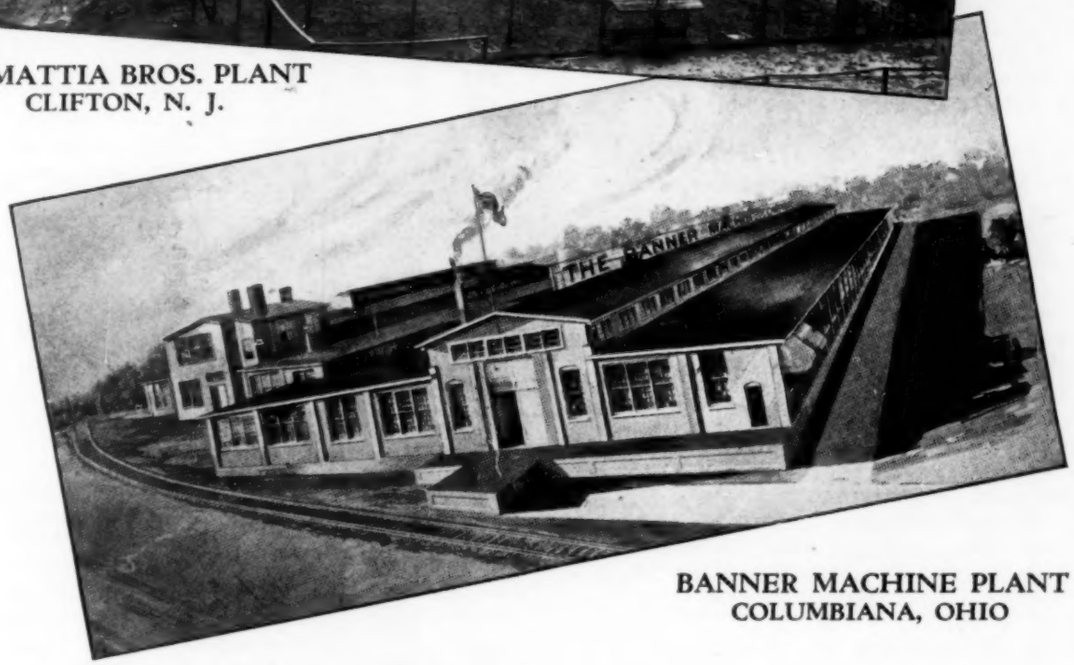

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